

NORTH WESTERN SECONDARY SCHOOL
EXAMINATIONS BOARD

REGULATIONS AND SYLLABUSES
FOR THE
CERTIFICATE OF
SECONDARY EDUCATION

1966

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NORTH WESTERN SECONDARY SCHOOL EXAMINATIONS BOARD
HOUSE 54 WHITWORTH STREET MANCHESTER 1

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CONTENTS

	<i>Page</i>
Regulations	3
Notes	6
Schedule of Syllabuses	7
Syllabuses	8
Appendices:	
A. Constitution of the Board	120
B. Governing Council	126
C. Examinations Committee	128
D. Finance and General Purposes Committee	130
E. Chairmen of Subject Panels	131

Regulations

REGULATIONS

INTRODUCTION

The Secretary of State for Education and Science has approved the North Western Secondary School Examinations Board to be the examining Board for the Certificate of Secondary Education for pupils in schools within the area of the counties of Cheshire and Lancashire and the County Boroughs of Barrow-in-Furness, Birkenhead, Blackburn, Blackpool, Bootle, Burnley, Bury, Chester, Liverpool, St. Helens, Southport, Stockport, Wallasey Warrington, Wigan and the Isle of Man.

DATE OF EXAMINATIONS

The examinations will take place in 1966 in accordance with the published time-table.

ELIGIBILITY OF CANDIDATES

Candidates attending schools must be aged 16 by 1st September of the year of the examination or in the final term of the fifth year of a five year course of secondary education, or must have completed such a course.

Where, however, appropriate facilities for such courses do not exist in secondary schools and pupils are obliged to complete their course in establishments of further education, such pupils may also be entered by the college they attend. (Technical secondary schools housed in Technical College buildings are regarded as secondary schools).

The Board will accept at its discretion other candidates provided that they are aged 17 by 1st September of the year of the examination.

EXAMINATION CENTRES

The Board will supply, on request, an official form on which Heads of schools may apply for official registration. The Head will normally act as the local examinations secretary and be responsible for the proper conduct of the examination. The Board reserves the right to send a representative to any school at any time to inspect the arrangements for, and conduct of, the examination.

ENTRY OF CANDIDATES

The Secretary of the Board should receive entries for the examination on the prescribed form not later than 20th December, 1965. These forms will be sent by 21st November, 1965 to those schools registered as examination centres.

Candidates must be entered by the School Heads. All correspondence will be with the Heads and not with candidates.

Regulations

SUBJECTS OF THE EXAMINATION

The Board is prepared to offer external examinations in 1966 on the syllabuses printed in this booklet viz:

Arithmetic	German
Art and Craft	Government and Citizenship
Biology	Health Education
Building Geometry and Drawing	History
Chemistry	Mathematics
Commerce	Metalwork
Domestic Science	Music
Engineering Science	Needlework
Engineering Workshop Theory and Practice	Physics
English Language	Principles of Accounts
English Literature	Religious Knowledge
French	Rural Studies
Geography	Science
Geology	Shorthand
Geometrical and Engineering Drawing	Spanish
	Typewriting
	Woodwork

MODE OF EXAMINATIONS

The Board offers a certificate awarded on the result of examinations conducted on the following Modes:

- Mode I: Examination on syllabuses set by the Board and marked under the Board's arrangements.
- Mode II: Examinations set by the Board on syllabuses prepared by an individual school or group of schools and approved by the Board.
- Mode III: Examinations by a school or group of schools on their own syllabuses, approved by the Board, the results being moderated by the Board.

Any school or group of schools submitting a syllabus for examination in 1966 under Mode II or Mode III should send 20 copies of the syllabus to the Board not later than 15th June, 1965. Mode III syllabuses should be accompanied by 15 copies of specimen questions.

EXAMINATION FEES

The fees per candidate for 1966 will be £1 entry fee and £1 for each subject. Fees will not be refunded under any circumstances. For any candidate whose name has to be added to the original lists, the subject entry fee will be £2 for entries received by the Board after 20th December, 1965 but not later than 20th January, 1966. A further special charge will be made for entries after that date. The Board reserves the right to refuse any such additions as late entries.

DISQUALIFICATION

Any candidate suspected of using, or attempting to use, unfair means will be reported to the Board. If the Board is satisfied that a breach of the regulations has been committed the candidate will be liable to disqualification from the examination.

Regulations

EXAMINATION RESULTS

Results of the examinations will be expressed for each subject in the form of Grades from 1 to 5. A 16-year-old pupil of average ability and application may reasonably expect to secure Grade 4. A 16-year-old pupil whose ability is such that he might reasonably have secured a pass in the Ordinary Level of the G.C.E. examination may expect to secure Grade 1. The examination result of a pupil whose performance is inferior to Grade 5 will be shown as ungraded.

As soon as possible after examinations, result lists showing each candidate's grades from 1 to 5 in each subject and all ungraded results will be sent to the Head of the school who will be responsible for informing candidates of their performance.

CERTIFICATES

A Certificate of Secondary Education will be awarded in the form and in accordance with the conditions laid down by the Secretary of State for Education and Science:

- (a) A Certificate of Secondary Education will be awarded only to those candidates who secure at least one Grade in the range 1 to 4.
 - (b) Where a certificate is issued, it will also record Grade 5 performances.
 - (c) Other Grade 5 performances and all ungraded results will be officially communicated to the candidate's school but will not be recorded on a certificate.
-

NOTES

The syllabuses in this booklet are for the 1966 examinations. The Board is charged with the frequent review of syllabuses, which may lead to the introduction of new subjects or the withdrawal of certain subjects.

ARITHMETIC. The Examinations Committee is of the opinion that the inclusion of Arithmetic as a separate examination subject is to perpetuate an undesirable restriction on the teaching of Mathematics. However, in view of the demand from schools in the region, the Committee has agreed to offer Arithmetic as a separate subject for at least three years (1966—1968) during which the matter will be reviewed.

No candidate will be allowed to offer both Arithmetic and Mathematics in the same examination.

SCIENCE. The Board hopes that schools which approach the study of Science through themes and topics will submit their syllabuses under Mode III.

SYLLABUSES

	<i>Page</i>
Arithmetic	8
Art and Craft	10
Biology	14
Building Geometry and Drawing	23
Chemistry	25
Commerce	28
Domestic Science	30
Engineering Science.. .. .	32
Engineering Workshop Theory and Practice	34
English Language	36
English Literature	38
French	41
Geography	44
Geology	50
Geometrical and Engineering Drawing	52
German	55
Government and Citizenship	57
Health Education	60
History	63
Mathematics	70
Metalwork	80
Music	82
Needlework	85
Physics	87
Principles of Accounts	97
Religious Knowledge	99
Rural Studies	105
Science	111
Shorthand	114
Spanish	116
Typewriting	118
Woodwork	119

ARITHMETIC

Candidates who offer Mathematics may not be presented for this subject in the same year (See also Notes on page 6).

FORM OF EXAMINATION

There will be two papers each allocated 50% of the marks. Paper I will be planned to take $1\frac{1}{2}$ hours but candidates will be allowed up to 2 hours. Paper II will be of 2 hours preceded by 10 minutes for reading the paper. In Paper II candidates will be able to answer the required number of questions from one or more of the three sections.

The use of mathematical tables and slide rules will be permitted providing the required degree of accuracy is obtained.

Practice in short methods should be encouraged.

SYLLABUS

PAPER I

GENERAL

Number notation including the binary system. Large and small numbers in standard form — binary notation. Four rules applied to money, weights, time and measure. Four rules applied to fractions, vulgar and decimal. Percentage. Decimalisation of money, weights and measures. Metric system. All branches of the system, but using the units in general use. Time, speed and distance. Averages, ratio and proportion. Squares and square roots by any method (including use of the table). Approximations and significant figures. Use of common logarithms (including negative characteristics).

GRAPHS

Plotting or sketching of graphs and the interpretation of them. Pictorial diagrams of all kinds. Conversions (e.g. Centigrade to Fahrenheit). Comparisons (e.g., imports and exports, changes in population, cost of transport by rail and bus, etc.). Use of graphs as ready reckoners.

MENSURATION

Rectangle, triangle, parallelogram and trapezium, circle, cube, cylinder, prism, right cone, pyramid and sphere. Application of the Theorem of Pythagoras. Scales (maps, etc.). Ratios of areas of similar regular figures and volumes of similar solids. Relevant formulae will be given.

PAPER II

SECTION A

COMMERCIAL

Income and expenditure accounts, personal and public. General problems involving money, weights and measures, with extension to metric system and main foreign currencies. Profit and loss, commission, discounts, etc. Partnerships and proportional parts. Simple interest, compound interest (kept to levels where the calculations may be done by long method), depreciation. Stocks and shares. Rates, taxes, hire purchase, bankruptcy and insurance. Bills of exchange, discounting, equable date of payment for the settlement of several accounts. Interpretation of statistical graphs.

SECTION B

CITIZENSHIP

This section comprises topics connected with personal accounts, household expenses, local and national finance. Household accounts including hire purchase, decorating, furnishing, heating and lighting. House purchase—rates and taxes. Insurance — salaries and wages. Post Office — savings and interest. Travel — travel time tables, foreign exchange.

SECTION C

EARTH MEASUREMENTS

A knowledge of instruments normally used in surveying and navigation will be assumed, but descriptions of these instruments will not be required. Navigational computers may be used in the examination.

Survey of classroom, school or part of large school, tennis court, playing fields, etc., by chain links and tape. Areas of surveys — calculations given dimensions of offsets. Heights by scale drawing — plotting to appropriate scales, rectangular surveys. Areas of triangulations — chain line; offset surveys. Heights by table of tangents. Areas of plane table surveys by scale drawing. Theodolite calculations, involving only right-angled triangles. Route charts, scales of Ordnance Survey maps. Road gradients. Circumference of Equator and meridians — e.g. length and breadth of continents. Circumference of parallels of latitude by scale drawing. Method of finding latitude of position of ships and aircraft. Planning map course, allowing for currents, tidal streams and winds.

ART AND CRAFT

GENERAL

This examination is designed to embrace all aspects of art education and to encourage in the candidate an awareness of personal experience and environment through the various creative activities and media. A general curiosity should be awakened in all things natural and man-made in order to develop the visual image, the powers of understanding and the ability to form sound judgement.

In the assessment of candidates' work, the best should reveal a proper balance between the aspects of imaginative design and creative skill but consideration will also be given to the type of topic or assignment selected, the nature of the activity and the choice of media.

FORM OF EXAMINATION

The examination will be in TWO parts:

- A. Course Work (40%).
Visual Research and Knowledge (10%).
- B. Work done under examination conditions (50%).

COURSE WORK

Selection will be by the candidate from work carried out during the two years before the examination.

The selection should not only reflect the candidate's personal choice but also, where possible, a broad range of experience in different media and wide interests.

- (i) Not more than *eight* pieces of work should be presented by the candidate for assessment of which *one* must be devoted to Visual Research and Knowledge.

A piece of work may be either one item or several items under one heading.

- (ii) Course work should be presented in as simple a form as possible to assist the assessor.
- (iii) The candidate and additional examples of his work must be available for the assessor.

VISUAL RESEARCH AND KNOWLEDGE

The inclusion of visual research and knowledge in course work is intended to encourage the relationship between the varied creative activities practised at school and in the larger visual world.

In this context, schools should feel free to interpret this section in any way according to the candidate's needs and interests.

The emphasis of the assessment will be on the *depth of the candidate's reaction* and not on any arbitrary standard of taste.

Written work may be included but should be used to clarify or supplement visual statements by the candidate.

Candidates should be encouraged to make good use of their own time and need not carry out this section wholly in school.

The candidate will present evidence of some personal research into his environment or any aspect of art or applied design as *one piece of work including several items*.

WORK DONE UNDER EXAMINATION CONDITIONS

A candidate will select and attempt ONE question on a chosen "area of activity".

The examination will be in THREE phases:

1. PREPARATORY (10 school days)

The preparatory phase will not extend beyond 10 school days prior to the invigilation.

It will afford the candidate time for reflection on the choice of question and the range of media and materials to be used. A candidate will be allowed, if he wishes, to carry out preparatory roughs of his ideas and to research into sources of information.

A candidate will be allowed to take all or part of this preparatory work into the examination room for reference but it must be attached to the completed work presented.

2. INVIGILATION (3 hours)

This invigilated period of 3 hours is intended for the candidate to commit his ideas free from outside assistance and will be conducted under routine examination conditions.

3. COMPLETION (15 hours including 3 hours of invigilation)

The time allowed for the completion of work will not exceed 15 hours including the time allowed for invigilation, and will not extend beyond 15 school days including that on which invigilation takes place.

Some candidates may not need the maximum time allowances given above; a candidate will be allowed to withdraw from the examination when he feels his work is complete.

AREAS OF ACTIVITY

The content of the syllabus is presented as five Areas of Activity.

The subjects within each area of activity have been selected because they are related. The division into areas of activity must not be considered rigid or final.

The areas may be extended in the light of changing circumstances.

The syllabus content for Photography is given in greater detail for added guidance.

1. FINE ART AND PHOTOGRAPHY

PICTORIAL COMPOSITION ILLUSTRATION
DIRECT OBSERVATION PATTERN PHOTOGRAPHY

This area of activity is two-dimensional and may be either figurative or non-figurative.

It is intended to stimulate that imaginative interpretation which stems from a lively curiosity about environment. Any medium or combination of media may be used.

The following additional points for Photography must be noted:

- (i) Photography is an adjunct to a general art course.
- (ii) Although basic techniques and printing practice will be taught, technique must develop from a candidate's experience.

(iii) Chemistry and optics are not considered to be subjects of study.

(iv) Content:

- (a) Familiarity with formats in common use.
- (b) Reflex and rangefinder cameras.
- (c) Types of film, their limitations and use.
- (d) Depth of field, focus, deliberate mis-focus.
- (e) Some knowledge of elementary studio lighting.
- (f) Familiarity with all aspects of developing and printing, including a knowledge of specialised techniques: tone separation, over-development, grain (fine and extended), etc.
- (g) The ability to produce clean prints of reasonable quality up to 10 in by 8 in.

2. THREE DIMENSIONAL

POTTERY MODELLING CARVING CONSTRUCTIONS
MOBILE SCULPTURE PAPER SCULPTURE CANE WORK

This area of activity can be either figurative or non-figurative.

It is intended to test creative ability, craftsmanship and skill in the use of materials and textured surfaces, together with the appropriate technical knowledge and design for the chosen subject.

3. GRAPHIC DESIGN AND PRINTING PROCESSES

PRINTMAKING TYPOGRAPHY LETTERING (formal and applied)
BOOK DESIGN

This area of activity is two dimensional and can be either figurative or non-figurative.

It is devoted to work in fields that require imagination in association with the development of skills. The approach to each section should arise as far as possible out of interests already held by the candidate. Credit will be given for method in the use of tools and material, and for full exploration of their potential.

4. TEXTILES, FASHION AND THEATRE

FABRIC PRINTING WEAVING CREATIVE EMBROIDERY DRESS
STAGE DESIGN PUPPETRY SOFT TOY MAKING

This area of activity is either two or three dimensional and may be figurative or non-figurative.

It is intended to encourage an imaginative approach through the media of the chosen activity. Although techniques will be taught, technique must develop from the candidate's personal experience.

5. EXPERIMENTAL DESIGN

This area of activity is non-figurative and may be either two or three dimensional.

It is intended to encourage a response to the stimuli of given materials, an analytical approach based upon observation, and a practical interpretation of non-figurative and environmental aspects of design.

- Space as a positive factor.
- Line arrangement.
- Development from circle.
- Development of angular shapes.
- Area division.
- Colour as a basic experience.
- Design in motion.

VISUAL RESEARCH AND KNOWLEDGE

Candidates should be encouraged to visit Art Galleries and exhibitions, to work together on visual projects such as theatrical productions and murals, to correlate Art and Craft with other school subjects and to take a perceptive interest in their surroundings.

The following topics or assignments are some suggestions:

- (i) A sketch book recording the candidate's selected visual interests.
 - (ii) A sketch book recording a particular assignment, e.g. visual comparisons of local domestic architecture or churches or factories or bridges.
 - (iii) A collection of natural forms supplemented by illustrations of comparable equivalents such as contemporary sculpture or painting or pottery.
 - (iv) Illustrations or photographs, either original or extracted from any form of publication, showing comparative developments in style, manner or technique in the design of such things as costume, pottery, town planning, aircraft.
 - (v) A visual history of an aspect of any art form or craft, either past or contemporary. Illustrations must be done by the candidate and supplemented by written work where necessary. Examples of possible topics are developments in landscape painting or furniture design or clay decoration, the different styles of Picasso, types of abstract painting, the influence of the different materials utilised by contemporary sculptors.
-

BIOLOGY

FORM OF EXAMINATION

The examination will comprise:

- (a) Two Written Papers each of 1½ hours (80%).
- (b) Practical Examination (20%).

WRITTEN PAPERS

Each paper will be allocated 50% of the marks for the written papers.

In Paper I the questions will be of the short answer and short essay types, and will cover a study of basic biological principles applied to a variety of living organisms. A knowledge will be required only of sufficient detail to illustrate the principles concerned.

Paper II will be in two sections, Section 'A' Pure Biology and Section 'B' Applied Biology, and will be based on Part II of the syllabus. Candidates must study to some depth one alternative from Section 'A' and one from Section 'B'. The alternatives may be studied as individual projects or as group work and the emphasis should be on observation and practical work. All members of a class need not study the same alternative.

PRACTICAL EXAMINATION

This will be based on Part I of the syllabus. It will be marked internally as arranged by schools; one school may act as a centre for several schools if this arrangement is more convenient. The examination will consist of ten short tests of manipulation and observation set up in the school. Each candidate will be provided with a printed sheet on which to record results, observations and deductions. It is expected that each candidate will be able to complete the examination in about thirty minutes.

NOTE: The examples given throughout are only suggestions. It is hoped that teachers will use any material which is available to illustrate the syllabus.

SYLLABUS

PART I

THE STUDY OF BASIC BIOLOGICAL PRINCIPLES

ORGANISATION OF LIVING THINGS

Simple structure of plant and animal cells to show similarities and differences.

Tissues, simply illustrated.

Organs, simply illustrated.

Organisms, simple examples to show that they may be unicellular or multicellular.

SUGGESTIONS

e.g. cell from lining of cheek, cells from moss, Elodea, or onion.

e.g. epidermis of iris or other monocotyledon, leaf, muscle.

e.g. leaf, heart.

LOCOMOTION

Movement of simple cells.

Movement of fish, bird and a land mammal.

Simple outline of Skeleton of mammal.

Joints, ligaments, tendons. Antagonistic movement of muscles.

External structure of fins and wings.

Names of main bones will be required.

Biology

RESPIRATION

Gaseous exchange in plants, insects, a bony fish and named mammal.

Transport of gases in higher animals.
Tissue respiration.

NUTRITION

Food — types, functions and tests.

Animal nutrition (holozoic).

Ingestion by a unicellular organism and higher animals. Teeth.

Digestion — need for digestion, food vacuoles, structure and function of alimentary canal and associated glands of a named mammal.
Simple properties of enzymes.

Absorption from food vacuole and gut.
Assimilation.

Egestion.

Plant Nutrition (holophytic).

Role of light, chlorophyll and carbon dioxide in photosynthesis. Formation of starch as food storage. Need for mineral elements. Evolution of oxygen.

Saprophytes — a mould or other fungus.

Parasites — a named animal parasite.
— a named plant parasite.

Food chains.

EXCRETION AND REGULATION

Elimination of waste products of metabolism in animals and plants.

Temperature regulation shown by skin of a named mammal.

SENSITIVITY

The response in plants and animals to stimuli, including a study of the eye,

the ear,

simple reflex action in a mammal.

Phototropism and geotropism in plants.

SUGGESTIONS

Food tests for glucose, starch, fat and protein only.

Structure and use of incisors, canines, premolars and molars.

Specific names of enzymes will not be required. Reference need only be made to salivary, gastric, pancreatic and intestinal juices and bile.

e.g. liver, kidney, skin of mammal.

Gaseous exchange in animals and plants.

Normal and defective vision. Details of microscopic structure not required.

Functions of hearing and balance.

Biology

REPRODUCTION AND GROWTH

- Principles of sexual reproduction in living organisms.
- Flower structure as seen in a simple flower.
- Pollination, fertilization.
- Seed development and dispersal.
Difference between a fruit and a seed.
- Germination.
- Sexual reproduction in — fish, frog, bird and mammal. Viviparity and parental care.
- Non-sexual reproduction in — a fungus, Amoeba, potato and couch grass.
- Main aspects of growth in living organisms. Increase in height, length, girth, weight.
- Simple introduction to heredity in connection with reproduction and variation.

TRANSPORT

- The importance of water to plants and animals.
- Simple study of osmosis and diffusion.
- Structure and functions of blood.
- Heart and circulation in mammal.
Differences between arteries, veins and capillaries.
Changes in composition of blood in lungs, kidney and liver.
- Lymph.
- Intake of water into a plant.
- Transport of water (root pressure, capillarity, transpiration pull).
- Transpiration.
- Transport of food substances.

SUGGESTIONS

- e.g. buttercup, deadnettle, wallflower.
- Broadbean, pea, sunflower.
- Fish is included to show random shedding of gametes into the water.
- e.g. as seen in seedlings, young locusts, or frog embryos.
- Include the story of Mendel's work. Chromosomes. Genes. Omit details of mitosis and meiosis.

Simple experiments on osmosis and diffusion will be required.

Diagram of heart need only be a diagrammatical vertical section.

Simple structure of a stem as seen under a hand lens.

Details of stomate movement not required.

PART II

SECTION A (PURE BIOLOGY)

ONE alternative must be studied.

ALTERNATIVE (i). PARASITISM AND SYMBIOSIS

Definition of terms: parasitism; symbiosis; commensalism.

The imperceptible gradation from free living to commensals, to symbionts, and finally to parasitism.

Biology

Examples of commensals, with life histories, e.g. hermit crab and sea anemone.

Examples of symbionts, with life histories, e.g. Zoochlorella in Hydra.

Examples of a few plant and animal parasites with life histories, e.g. mistletoe — semi-parasite; fungi — e.g. ringworm in cows, horses, man; mildew; potato blight; damping off; rusts, tapeworm, liverfluke, round worm, lice, fleas.

Economic importance of parasites.

ALTERNATIVE (ii). ECOLOGY

A detailed quantitative study of a well-defined habitat throughout the year.

Factors affecting habitat:

- (a) Physiographic — height, aspect, slope.
- (b) Climatic — rainfall, wind, light, temperature.
- (c) Edaphic — soil conditions.
- (d) Biotic — influence of plants and animals (adverse or beneficial).

Plant and animal life:

- (a) Distribution — methods of study: (i) quadrat, (ii) transect-line, belt.
- (b) Adaptation to environment.
- (c) Seasonal variation.
- (d) Relations amongst plant and animal communities.

The following examples of suitable habitats are given for guidance:

Pond	Waste ground	Rocky shore
Stream	Garden	Rock pool
Ditch	Tree	Pier or jetty
Marsh	Hedge	Sandy shore
Meadow	Copse	Sand dune
		Salt marsh

ALTERNATIVE (iii). ANIMAL BEHAVIOUR

It is important to carry out as many experiments as possible.

Stereotyped behaviour.

- (a) Taxes — e.g. (i) Paramecium; colonies; (ii) blind young rats on inclined plane.
- (b) Reflexes — any suitable human reflex action.
- (c) Instinctive behaviour — dependence on internal environment, hormones, e.g.
 - (i) reproduction behaviour of sticklebacks, use of dummies, importance of red breast,
 - (ii) courtship, parental care.

Learning.

- (a) Imprinting — e.g. young birds following any moving object.
- (b) Conditioning.
- (c) Trial and error — e.g.
 - (i) Work of Pavlov.
 - (ii) Box opening by cats.
 - (iii) Earthworms in mazes.
 - (iv) Bees' food on blue paper — not grey.
 - (v) Cockroaches or ants in mazes.
 - (vi) Maggots in choice chambers.
 - (vii) Communications — in bees.
— alarm cries.

Complex behaviour.

Reasoning — e.g. detour problems. Work of Köhler on behaviour in chimpanzees.

Biology

ALTERNATIVE (iv). CONSERVATION

What is meant by conservation; the 'balance' of nature; squandering of natural resources; environmental changes brought about by man; soil management; crop rotations; irrigation; contour ploughing.

A study should be made of **one** of the following three topics:

- (a) Wild Life Conservation — food chains; pyramid of numbers; the soil; plant and animal succession; drainage.
- (b) Forestry Conservation — what foresters do; make up of a tree; identification of trees, woods, seeds; fire; planting and thinning; destructive insects.
- (c) Soil and Water Conservation — Effects of clear felling; cattle grazing; fire.

In the fields, the effects of:

- (i) gullies and rills,
- (ii) wind erosion,
- (iii) raindrop splash,
- (iv) poor drainage.

In streams and ponds the effects of:

- (i) pollution,
- (ii) bank erosion,
- (iii) sedimentation.

Along the roads the effects of:

- (i) roadbank erosion.

ALTERNATIVE (v). EVOLUTION

Change in animal and plant life through the ages in relationship to the changes in their environment.

Evidence for Evolution — fossil evidence; evidence from similar basic structure; evidence from embryonic development; evidence from vestigial structures; present day appearance of new forms.

Life in the Ancient Seas — trilobites, jelly fish, sea worms and primitive snails; sea scorpion; first fish; fish.

Conquering the Land — early land plants; insects; amphibians and early reptiles; life in the coal age forests; giant reptiles, first birds, fish-like reptiles.

Age of Mammals — true mammals and their characteristics; evolution of the horse; tarsioids; first ape-men; Pekin man.

Causes of Evolution — theories of Lamarck; theories of Darwin.

ALTERNATIVE (vi). NATURAL HISTORY, FLOWERING PLANTS

Main studies to be restricted to common local species.

Structure of regular, irregular and composite flowers.

Pollination. Structure adapted for pollination mechanisms.

Examination of plants in the school locality (including study of weeds in garden).

Method of collecting and carriage — making a permanent collection. (If children are going afield, stress rules of countryside and discourage wasteful tearing up of specimens — roots should not be disturbed.) Pressing of specimens.

Arrangement of collection (Latin names will not be required in the examination).

"Family" headings, e.g. the buttercup family, the rose family, etc. Notes of habitat, season of flowering, etc. should be given with each specimen.

Biology

ALTERNATIVE (vii). NATURAL HISTORY, BIRDS

Main studies to be restricted to common species.

External features — naming of parts.

Adaptations for flight — wings as modified limbs, structure of a feather, skeleton, muscles and mechanics of flying.

Beaks and feet — in relation to feeding habits.

Habitats, nesting sites and materials used. Structure of an egg.

Residents and non-residents — migration and summer and winter visitors.

Useful and harmful birds — their effects on crops, insects and other wild life.

Bird watching — identification and observation of habits.

ALTERNATIVE (viii). NATURAL HISTORY, FISH

Main studies to be restricted to common local species.

External features.

Adaptations for aquatic mode of life.

Life histories — a range of examples should be considered, e.g. eel, salmon, dogfish, herring, etc.

A detailed study of *either* marine fish and fishing, *or* fresh water fish and angling.

ALTERNATIVE (ix). NATURAL HISTORY, BUTTERFLIES AND MOTHS

Main studies to be restricted to common local species.

Structure and life history of Lepidoptera.

Methods of collecting eggs, larvae, pupae and adults for:

(a) rearing — to include investigation into ideal humidity and temperature conditions, pupation period and feeding of both larvae and adults.

(b) preserving — killing, relaxing, storing, pinning and accurate labelling.

If any specimens are affected by ichneumons, they should be segregated and the activities of the parasite studied.

Lepidoptera as pollinators.

Lepidoptera as pests — suggested examples, clothes moth and cabbage white.

Camouflage in Lepidoptera — suggested examples, peppered moth, goat moth, frosted green.

SECTION B (APPLIED BIOLOGY)

ONE alternative must be studied.

ALTERNATIVE (i) HORTICULTURE

Soils — origin, mineral and organic, topsoil and subsoil. Simple mechanical analysis — humus, sand and clay separated in water. Properties of sand and clay in relation to water-holding capacity. Testing for lime — use of universal indicator.

Manures and fertilisers — nitrates, phosphates and potash — water cultures and/or plot experiments to illustrate effects of these salts. Compost heap — carbon and nitrogen cycles.

Biology

The earthworm — life history and external features; effects on soil.

Plant propagation — seed sowing with experiments to show conditions needed. Vegetative propagation, including stem cuttings, soft and hard, advantages and disadvantages. Annuals, biennials and perennials, cultivation of common vegetables, use of tools.

Insects — life history and methods of control of cabbage white butterfly and greenfly.

ALTERNATIVE (ii) AGRICULTURE

Soils — origin, mineral and organic, topsoil and subsoil. Simple mechanical analysis — humus, sand and clay separated in water. Properties of sand and clay in relation to water-holding capacity. Testing for lime — use of universal indicator.

Manures and fertilisers — nitrates, phosphates and potash. Water cultures and/or plot experiments to illustrate effects of these salts. Farmyard manure — carbon and nitrogen cycles.

The earthworm — life history and external features; effect on soil.

Farm studies — a study of an arable, livestock or mixed farm.

ALTERNATIVE (iii) PLANT AND ANIMAL BREEDING

Chromosomes in cell division — function of chromosomes, formation of gametes, mitosis and meiosis. Mendel's law of dominance. Mendel's second law. Monohybrid and dihybrid crosses (*Drosophila* could be used for practical work).

Aims of breeding — production of disease resistant strains in plants, such as rust-free wheat. Improving animals and plants by selection, as in merino sheep for wool; dairy and beef breeds of cattle.

Inbreeding and outbreeding — in domestic animals such as cows, cats, dogs.

ALTERNATIVE (iv) HISTORY OF BIOLOGY

Famous biologists — brief outline of biology from Aristotle to Darwin, including the work of Leonardo da Vinci, Harvey, Van Leeuwenhoek, Linnaeus, Lamarck. Jenner and preventive medicine. Work of Pasteur and Lister. Ross and the conquest of malaria. Discovery of insulin by Banting and Best. Fleming and the discovery of penicillin.

Contemporary biology — vitamins and deficiency diseases; uses of radiation, its benefits and hazards; world problems of over-population, disease and food shortage; the work of UNESCO and World Health Organisation; ways of increasing world food production and standards of living.

Control of disease — in human beings, other animals and plants.

ALTERNATIVE (v) PUBLIC HEALTH

Clean water — location of reservoirs, treatment of water, provision of an adequate water supply; sewage disposal by filter beds and aeration methods; disposal of sewage and its use; sanitation and refuse disposal.

Clean food — production of milk, including sterilisation and pasteurisation processes; handling and storing of food; refrigeration and preservation methods.

Clean air — problems of overcrowding; heating and ventilating public buildings; control of insect pests, e.g. house fly, use of insecticides.

Biology

Diseases — infection by common bacteria and viruses; methods of control; Jenner and anti-smallpox vaccination; Pasteur and Koch; Fleming and penicillin; Salk and polio vaccine; Röntgen and X-rays; mass radiography and the control of tuberculosis.

Work of Public Health Department — control of vermin, mice, rats, parasites and the treatment of verminous persons, clothing and houses.

ALTERNATIVE (vi) USEFUL AND HARMFUL INSECTS

General features of insects — basic insect characteristics without technical names for parts of legs, jaws, etc.

Insect life-cycles — the two types of insect life-cycle, illustrated with reference to useful and harmful species (fly, bee, locust).

Useful insects:

- (a) insects which provide food: bees (honey), and other pollinators;
- (b) insects which provide clothing: silkworm;
- (c) insects used in weed control: cactus moth;
- (d) scavengers: sexton beetle.

Harmful insects:

- (a) insects and disease: mosquito and malaria, flea and plague, house-fly and food poisoning;
- (b) damage caused by insects:
 - to crops (locust, aphids, weevils);
 - to stored products (grain beetles);
 - to wood (woodworm, termites);
 - to clothing, etc. (clothes moth).

Control of insect pests:

- (a) natural control (birds, other insects);
- (b) insecticides — include dangers of over-use, danger to bees and birds, contamination of fruit;
- (c) biological control (braconids, ladybirds).

ALTERNATIVE (vii) FIRST AID AND PERSONAL HYGIENE

It is suggested that this section is not selected unless the teacher concerned is suitably qualified to teach First Aid. Great stress should be laid on doing only what is immediately necessary since great harm is often done to patients by first-aiders attempting too much.

Scope of first aid.

Structure and function of the human body.

- (a) The skeleton; joints and muscles; fractures, dislocations, sprains and strains; their recognition and treatment;
- (b) position of organs of the trunk; triangular bandages, slings, sterile and emergency dressings;
- (c) blood circulation; heart, blood vessels; clotting of blood; wounds, pressure points, haemorrhage, infection of wounds.;
- (d) respiratory system; asphyxia, drowning, choking, poisonous gas, electric shock, artificial respiration;
- (e) nervous system (outline only); shock, unconsciousness, burns, scalds, poisons;
- (f) foreign bodies in eye, ear, nose, throat and skin; stings and bites.

Biology

Personal hygiene — cleanliness and good grooming; clothing and footwear; exercise and rest.

Food — a balanced diet; nutritional defects; teeth and their care; importance of good hygiene in feeding; preservation and protection of food; diseases carried by food; effects of alcohol and smoking on the human body.

Excretion — good hygiene in excretion; infections of the skin; infection and immunity; bacteria; spread of infection; disinfection; immunity (natural and artificial); some common infectious diseases; their recognition and control.

Practical work — use of telephone; triangular bandages and their application; dressings and their application; pressure points and constrictive bandages; artificial respiration — Holger-Nielson method; mouth to mouth resuscitation; treatment of fractures; transport of injured persons.



BUILDING GEOMETRY AND DRAWING

FORM OF EXAMINATION

The examination will be in THREE parts:

- I. Course Work (25%). Candidates will submit not less than five marked drawings produced in school during the final year,
one of which shall be freehand,
two of which shall be detailed constructional
and two of which shall be geometrical drawings.
- II. A Geometry Paper of 2 hours (35%).
- III. A Drawing Paper of 2½ hours (40%).

Neatness and presentation will be taken into account.

Good work in one part of the examination will not compensate for bad work in another part in determining the final grade.

Half Imperial drawing paper is to be used in the Geometry and Drawing papers.

Drawings should conform to the recommendations of B.S. 1192 and B.S. 308.

SYLLABUS

GEOMETRY

1. INSTRUMENTS. Care and use of instruments.
2. PRINTING. The pattern of printing should be as recommended by B.S. 1192 or B.S. 308 (latest editions). Printing should be between guide lines.
3. LINES. Definitions—horizontal, sloping, vertical. Types of lines as in B.S. 1192. Bisection. Division into equal or proportionate parts. Plane and diagonal scales. Simple geometric patterns.
4. ANGLES. Right, acute and obtuse. Bisection. Reproduction of angles. Setting up perpendiculars on, above, or at the line. Construction of angles with compasses down to 15°. Protractor work. Adjacent, corresponding, supplementary, complementary angles.
5. TRIANGLES. Types of triangles named by reference to sides, and by reference to angles. Construction of triangles from given data.
6. CIRCLES. Definitions of parts of circles. Properties of circles.
7. CIRCLE-APPLICATION. Locating of centres by bisection of chords. Circumscribed and inscribed circles to triangles and polygons. Problems on circles in contact. Circles in mouldings. Profiles of arches based on the circle. Angles in segments and in the semicircle.
8. QUADRILATERALS. Definitions of quadrilaterals and names. Square, rectangle, trapezoid, trapezium, rhombus, rhomboid, parallelogram, deltoid. Construction of quadrilaterals from given data.
9. POLYGONS. Definitions. Regular polygons of five to twelve sides. Construction of regular polygons as above, from given data. Construction of irregular polygons from given data.

Building Geometry and Drawing

10. ENLARGEMENT AND REDUCTION. Enlarging in terms of length and/or width. Proportional enlarging and reducing in terms of length of side and in terms of area. Reduction of pentagons to triangles of equal area. Reduction of rectangles to squares of equal area. Reduction of triangles to squares of equal area.
11. TANGENTS. To circles, multiple circles and approximate ellipses.
12. ELLIPSES. Construction of ellipses. Problems on the ellipse. Normal. Tangent. Parallel curve.
13. LOCI. Loci of points equidistant from
 - (a) two straight lines,
 - (b) a point and a line,
 - (c) a circle and a line,
 - (d) two circles (external to each other, and one inside the other).(Application to the construction of tangential arcs).
14. SOLID GEOMETRY. Orthographic projections—in accordance with B.S. 1192. Orthographic projection of solids. The planes of projection. Plans and elevations. Sections. Projections of simple solids, and simple solids inclined to one plane only. Auxiliary projections and sections of right solids and the development of their surfaces. Conic sections—ellipse, parabola, hyperbola, circle, triangle.
15. PICTORIAL DRAWING. Conventional isometric (i.e. without use of isometric scale) to include exploded views and the isometric circle. Oblique (with the oblique lines at 45° and at half scale).
16. INTERPENETRATION. Interpenetration of right solids, prisms, pyramids and circular cylinders (excluding cones).

Consideration should be given to application of the above to true building problems and details.

DRAWING

1. FOUNDATIONS. For 9 in solid walls and cavity walls 11 in thick, as in model bye-laws.
2. WALLS. 9 in solid and 11 in cavity. For drawing purposes a standard brick of 9 in by $4\frac{1}{2}$ in by 3 in should be used. Bonding in Stretcher, English and Flemish bondings up to 9 in thick. Quoins. Squared stopped ends. Masonry sills, lintels, thresholds and stone dressing. Simple copings in brick and stone. Damp proof courses. Flat, segmental and semi-circular arches.
3. FLOORS. Single and solid ground floors and single first floors, to include trimmings to hearths and staircases. Strutting.
4. ROOFS. Single up to 16 ft span. Lean to couple, close couple and collar beam. Eaves detail. Board covering only.
5. WINDOWS. Single opening casement, opening outwards only. Fixed light. Mullion and transome. Splayed and pencil rounded finishes only.
6. DOORS. Framed, ledged and braced doors. Panelled doors to include single to four panels, with simple flat and rebated panels, with planted or stuck mouldings. Flush doors and glazed doors.
7. WINDOW AND DOOR OPENINGS. Frames and linings. Architraves.
8. FREEHAND DRAWING. Freehand drawings of constructional details, hand tools or equipment, should be encouraged throughout the course.

CHEMISTRY

FORM OF EXAMINATION

The examination will comprise:

- (a) A Theory Paper of 2½ hours (70%)
- (b) Either A Practical Examination of 2 hours (30%)
Or Individual Practical investigation (30%)

THEORY PAPER

The paper will consist of three sections.

Section A will contain twenty compulsory questions requiring short answers and will be allocated 25 of the 70 marks for the paper. Candidates will be advised to spend about one hour on this Section.

Sections B and C will each contain four questions of which candidates must answer two.

GENERAL

In order that the examination shall be forward looking it is recommended that ionic equations be used whenever applicable, that concentrations of solutions be expressed in molar terms and that when dealing with an element which shows variable valency the modern system of nomenclature be adopted, e.g. cupric copper as copper II; cuprous copper as copper I.

Thus cupric and cuprous oxides become copper II oxide and copper I oxide respectively.

SYLLABUS

THEORY

1. Elements, compounds and mixtures; their characteristics; the division of elements into metals and non-metals. Families of elements e.g. alkali metals, alkaline earth metals, halogens.
2. A simple treatment of the structure of matter developed from the Dalton theory to modern theory in terms of fundamental particles — the proton, the neutron and the electron; the properties of these particles in terms of mass and charge; atomic number and atomic weight. An elementary introduction to the periodic classification of the elements (excluding transitional elements and rare earths). Isotopes; arrangement of electrons in shells or energy levels; valency; electrovalency and covalency; examples; properties associated with these bond types; ions and their movement; electrolysis.
3. The gram atom, the gram ion and the gram molecule; Avogadro's number; quantities described in these terms; the building up of chemical equations from the reacting quantities of matter.
4. Air-composition (oxygen, nitrogen, carbon dioxide, water vapour, rare gases); air pollution; breathing and respiration in animals and plants; rusting.
5. Properties and uses of oxygen; oxides (including hydrogen peroxide), acids, bases and salts (this includes the preparation of salts by the standard methods); use of indicators — methyl orange, phenol phtalein and universal indicators. The action of dilute mineral acids on carbonates, bi-carbonates, sulphites and sulphides.

Chemistry

6. Water — physical properties and composition (electrolysis of acidulated water to show volume composition but without explanation); solubility; determination of the solubility of a simple salt at various temperatures; chemical properties of water; natural waters, hardness and methods of softening; practical determination of hardness by titration with soap solution; hydration, efflorescence, deliquescence and hygroscopy.
7. Chemical reactions and energy; the types of chemical change—oxidation/reduction, catalysis, electrolysis; heats of reaction, e.g. neutralisation.
8. Fuels — complete and incomplete combustion; carbon monoxide; coal, coal gas, oil, butane, methane, ethylene and acetylene, producer gas, water gas; the commoner products of coal and petroleum; destructive and fractional distillation (explanation of fractional distillation merely in terms of difference of boiling points).
9. Carbon — graphite, diamond, charcoal and soot; carbon dioxide — properties and uses. Photosynthesis; starches and sugars; tests; fermentation; conversion of ethyl alcohol to ethylene and acetic acid.
10. The extraction of metals; general principles — reduction and electrolysis; activity series; corrosion; a comparison of the properties of magnesium, zinc and copper in terms of the elements themselves and their oxides, hydroxides, chlorides and carbonates.
11. Sulphur as an example of a non-metal; allotropes of sulphur — their preparation; properties of sulphur dioxide; properties of sulphuric acid (not oxidation); sulphates.
12. Study of sea water — source of common salt, hydrochloric acid and chlorine and sodium hypochlorite; properties of hydrochloric acid; chlorides.
13. Nitrogen compounds — ammonium salts; action of bases on ammonium salts; solubility of ammonia; sublimation of ammonium compounds; properties of nitric acid; nitrates.
14. Calcium compounds — calcium carbonate, calcium oxide, calcium hydroxide; mortar and concrete; calcium sulphate.

N.B.—No detailed methods for the preparation of gases will be required. Equivalents are not regarded as fundamental and are omitted. Laws of fixed and multiple proportion are omitted.

PRACTICAL

1. Techniques — filtration, crystallization and crystal shape, evaporation and extraction, chromatography.
2. Qualitative tests — carbon dioxide and carbonates; sulphur dioxide and sulphites; hydrogen sulphide and sulphides; oxygen and hydrogen; ammonia and ammonium salts. Tests on compounds studied in the theory syllabus.
3. Solution and solubility — qualitative aspects only.
4. Preparation of salts on a small scale (semi-micro); e.g. (a) neutralisation — including acid salts; (b) basic oxide — acid reaction; (c) carbonate — acid reaction; (d) precipitation reactions.
5. Use of molar and partial molar solutions to construct equations.
6. Accurate use of the burette, pipette and balance.

Chemistry

7. Electricity — to distinguish (a) metals; (b) electrolytes and non-electrolytes and (c) collection and identification of the products of electrolysed solutions.

For the Practical examination candidates may use text books or laboratory notebooks.

INDIVIDUAL PRACTICAL INVESTIGATIONS — OR PROJECTS

Schools may offer this as alternative to the Practical examination. Preparation of this work will be undertaken in the years leading up to the Theory examination. Candidates will be required to undertake **two** projects of their **own** choice from the general classifications below. The projects must belong to different classes.

- (a) Industrial: e.g. iron and steel, textiles, local chemical industry.
- (b) Domestic: e.g. plastics, water supply and sewage disposal, detergents and washing.
- (c) Agricultural: e.g. pest control, food and the body, nitrogen and artificial fertilisers.
- (d) Chemical techniques: e.g. radiochemistry, photography.

In each piece of work a practical and theoretical approach will be required.

QUANTITATIVE WORK

It is hoped that suitable quantitative work will be undertaken during the course. Some suitable experiments are:

1. The quantitative determination of the action of heat on copper sulphate crystals.
2. The quantitative reduction of copper oxide with coal gas.
3. The quantitative neutralization of a standard solution of sulphuric acid with a standard solution of barium hydroxide. This experiment may also be used to show ionic conductance.
4. The quantitative precipitation of lead iodide from lead nitrate and potassium iodide solutions.
5. The quantitative thermal decomposition of zinc carbonate.
6. The quantitative replacement of cupric ions (copper II) by zinc.
7. Determination of the hardness of water by titration with soap solution. Comparison of titres as a means of comparing hardness of different waters.
8. Determination of the solubility of a simple salt at different temperatures and the construction of a solubility curve.

COMMERCE

GENERAL

The basis of the following syllabus is the interaction of the individual and the commercial world. The approach should be two-fold:

- (a) to give the pupil a broad understanding of how the economy works;
- (b) to develop the pupil's awareness of his role as a consumer, potential wage-earner and tax-payer.

Pupils should be encouraged in as practical a way as possible to observe their own surroundings and how they fit into the general pattern, and to draw their information from a wide range of sources.

FORM OF EXAMINATION

The examination will consist of a single paper for which there will be a generous time allowance of $2\frac{1}{2}$ hours. The paper will be in two sections. Section A will contain compulsory questions requiring answers of only a few words. Section B will offer a choice of five questions out of at least eight, requiring longer answers. The maximum possible marks will be as follows:

- Section A (30)
Section B (70)

SYLLABUS

THE ECONOMY IN GENERAL

An understanding by the pupil, as a citizen, of the economic society in which he lives, and the way it operates. Brief reference should be made to the influence of the Government in the economy.

The relationship between consumer and producer — the need for specialisation, exchange. The flow of consumer and producer goods. How consumers' needs are met.

1. HOME TRADE. Wholesale Trade — services of the wholesaler to the retailer and manufacturer.

Retail Trade — trends in retail trading, services of the retailer, comparison between the different types of business organisations and the reasons for their co-existence.

Purpose of the documents used between supplier and purchaser — price list, catalogue and quotations, order, invoice, trade and cash discounts, consignment note, credit notes, statement and receipt.

Ownership of businesses.

- (a) Private ownership — sole traders, partnerships, companies (private, public, limited liability, preference shares, ordinary shares and debentures).
- (b) Co-operative Societies — retail and wholesale.
- (c) Public Ownership — by Government departments
e.g. Post Office
by local authorities
e.g. transport undertakings
by public corporations
e.g. B.B.C., B.E.A.

Profit — incentive of profit, gross and net profit, relation to turnover.

2. SERVICES. Banking — Commercial Banks, Savings Banks, Post Office (borrowing, depositing and other services).

Insurance and Assurance — the principles of insurance.

Commerce

Types of insurance, including — life, property and National Health Insurance. Purpose of the principal documents used in insurance.

Transport and communications.

- (a) Importance of transport: e.g. movement of goods and people. Effects on production and marketing, standards of living and international relationships.
- (b) Forms of transport and their advantages and disadvantages affecting choice.
- (c) Communications: Post Office services — telephone, cable, radio and television.

Advertising — the purpose and value of advertising in its various forms.

3. THE DEPENDENCE ON FOREIGN TRADE. The Balance of Payments — visible and invisible imports and exports.

Brief reference should be made to the influence of the Government in the economy.

THE INDIVIDUAL IN THE ECONOMY

As an individual, an understanding of his role as a consumer, a potential wage-earner and taxpayer.

Money management and the need for balance between spending and saving.

Spending — buying, renting, family budgeting, necessities and luxuries.

Wise Buying — a critical examination of the methods of advertising. Study of misleading, false and deceiving forms. Branded goods, indications of quality, trade marks, British Standards Institution, trading stamps, gifts, "sales," after sale services.

Credit — definition of credit and its function. Types of credit — retailers, hire purchase, clothing clubs, instalments, loans, borrowing from money-lenders, banks, insurance companies, building societies.

Methods of Payment — money as a medium of exchange, cash, cheques, postal orders, money orders, credit transfer, legal tender.

Saving — the need for saving — importance of degree of safety, speed of withdrawal and rate of interest. Methods of saving — National Savings, Post Office, Savings Banks, bank deposits, insurance policies, building societies, stocks and shares, Unit Trusts.

Protection of Consumer — rights of the consumer, "guarantees," Consumer Protection Societies, Consumer Research organisations.

A simple appreciation of taxation as it affects the individual, i.e. how it is raised and used:

- (a) at National level — the Budget, revenue and its allocation, direct and indirect taxation, P.A.Y.E.
- (b) at Local Government Level — rates and rateable value, services.

DOMESTIC SCIENCE

GENERAL

The examination will be based on wide outline courses, which allow for experiment, investigation and evaluation and will be designed to give schools, teachers and pupils scope to develop their own lines of interest and to relate these to other subjects in the curriculum.

The work in the syllabus should be preceded by a basic course during which the pupils will have acquired knowledge of fundamental methods and techniques.

Pupils should be aware of the variety of information and assistance available to the public, and develop discrimination in books, television, radio, the press, etc.

FORM OF EXAMINATION

The examination will be in FOUR parts:

- | | | | |
|---------------------------|----------|-----|----------------------------------|
| (a) Practical Examination | 2½ hours | 45% | |
| (b) Special Study | | 15% | |
| (c) Theory Paper | 1½ hours | 30% | (Section A 20%
Section B 10%) |
| (d) Course Work | | 10% | |

PRACTICAL EXAMINATION

The examination will be divided into TWO parts:

Part 1 will consist of a test lasting 1½ hours for which there will be a preparatory session of 45 minutes held *not less* than seven days before the test.

Part 2 will consist of a variety of short tests for which no preparation time will be allowed.

SPECIAL STUDY

The candidate will be expected to produce evidence of a detailed study of a topic of her own choice, and to answer oral questions on it. The work will be internally assessed and externally moderated.

The following list of topics for special study is given for the guidance of teachers:

- Heating the home — one aspect only to be considered, e.g. by electricity.
- Blankets.
- Refrigeration.
- Commodities.
- Buying a house.
- The work of a social service, e.g. the Citizens Advice Bureau.
- Child welfare locally.

Any topic, however, which is relevant to the syllabus would be accepted.

THEORY PAPER

The paper will be divided into TWO sections.

Section A will consist of a number of compulsory short-answer questions.

Section B will give a choice of two from seven essay type questions.

Domestic Science

SYLLABUS

1. **THE HOME.** Choice, cost, mortgage, insurance, rent, rates. Utility services: water, lighting, heating, removal of waste. Furnishing the home. Care and maintenance of the house and its contents.

2. **FAMILY LIVING.** Nutrition: provision of well-balanced family meals—special meals for children, invalids, old people, vegetarians; packed meals, parties, etc. Discrimination in the use of convenience foods.

Personal and household budgeting, including credit buying. Economy of time, labour, fuel, money. Consumer guidance, research and protection. Good grooming, including posture and diet. Modern approach to laundry-work. Safety precautions in the home, including correct use of equipment. Simple home nursing, first aid and child care.

3. **LIVING IN THE COMMUNITY.** The place of the young adult in the community; ways of serving others. Responsibilities, social behaviour.

4. **SOCIAL SERVICES.** Statutory: evening classes, libraries, youth clubs, welfare services (clinic, home help, etc.). National Assistance Board.

Voluntary: youth clubs, sports clubs, uniformed organisations, care of the old and handicapped, baby sitting.

COURSE WORK

This work will be marked by continuous assessment by the candidate's teacher.

ENGINEERING SCIENCE

GENERAL

The syllabus is based upon those aspects of Physics and Chemistry which are fundamental to the principles and practice of Engineering, and assumes that candidates offering this subject will have covered elementary General Science or Physics and Chemistry in the earlier stage.

By his course of studies, a pupil should have learned sufficient scientific facts, principles and procedures through engineering applications to be able to deal intelligently with similar problems he is likely to meet, and be prepared for continued more advanced studies in some branch of engineering.

The content aims to provoke interest by grouping in separate sections a number of applications out of which scientific principles or ideals will be evolved. Questions will be set on the assumption that the fields of application in each section will have been given a thoroughly practical treatment. Formal definitions will not be asked for and calculations of a simple nature will be limited to those applications or principles which are in *italics* in the syllabus.

In 1967 this examination will not be entirely theoretical.

FORM OF EXAMINATION

There will be two papers, each lasting 1½ hours, and made up of two sections, A and B. Section A will consist of twenty short type questions, including some simple calculations, and will carry 40% of the marks.

Section B will consist of five questions of greater length and difficulty, of which the candidate will be required to attempt three, and will carry 60% of the marks.

SYLLABUS

HEAT AND HEAT ENGINES

1. SOURCES OF HEAT. The origin, supply and uses of coal, coal gas, calor gas, diesel oil, petrol and paraffin. Very elementary principles of nuclear energy. Making heat available by using: blowlamps, bunsen burners, cooker-burners, domestic boilers. Comparison of the efficiencies of closed and open-fires.

2. EFFECTS OF HEAT. *Thermal expansion and contraction* and everyday effects — thermometers and *thermometric scales*, bi-metallic strips, thermostats, castings, expansion joints. Heat transfer — domestic hot water system, central heating circuit duct system; practical modern aspects of conduction, convection and radiation. The common heat units — British thermal unit (B.t.u.), celsius heat unit (c.h.u.), calorie (cal.), therm. Change of state — elementary casting procedures, solders and brazing rods, pressure cookers, *sensible heat* and *latent heat of steam*, use of anti-freeze, principles of absorption and vapour compression refrigerators, *specific heat*, principles of *method of mixtures* and mechanical equivalent of heat.

3. ENGINES. The motor cycle — four stroke and two stroke principles. The car engine — purpose, position and integrated working of the main parts — pistons, cylinders, crankshaft, timing gears, camshaft, valves, distributor, flywheel and clutch manifolds and simple carburettor. The coil ignition circuit. Principle of the compression ignition engine. Elementary principles of the steam turbine, jet and rocket propulsion.

SIMPLE MACHINES AND MECHANICS

The meaning and use of the terms — *force, moments, work, energy, power, friction, mechanical advantage, velocity ratio, efficiency* and the laws of motion by considering the following: levers, smooth inclined plane, screw and hydraulic jack, pulleys (including differential block), gears used for different purposes including the principles and action of a simple car gearbox and worm and bevel gears, chain and belt drives including derailleurs cycle gears, simple hydraulic brake system, vehicles in motion on level ground.

Triangle and parallelogram of forces in simple cranes and slings by graphical solution. Centres of gravity in relation to the distribution of loads on vehicles.

PRODUCTION, EFFECTS AND USES OF ELECTRICITY

Electricity as a form of energy. Current as a flow of electrons. Construction, uses and care of dry Leclanché and lead acid cells. Simple principles of electrolysis and electroplating. Permanent magnets and magnetic fields. Electromagnets — solenoids and simple relays.

Simple electric motors (a) with permanent magnets, e.g. toy train, (b) with field coils, e.g. car starter motor.

Simple practical generators: construction and elementary principles of car generator and cycle dynamo illustrating A.C. and D.C. principles. Electro-magnetic induction in practice: car induction coil, *step up* and *step down transformer (up to two secondary coils)*, outline of National Grid transmission, simple battery charger including ideas of full and half-wave rectification by metal rectifier.

The electric circuit: simple conventional and ring-main house circuit, earthing methods, types of socket and plug, fuses, water heaters, lamps.

Ohm's law. The volt, ampere, ohm and application to simple series and parallel circuits.

Paying for electricity. Watt, kilowatt hour.

ELEMENTARY INSTRUMENTS

Micrometer screw gauge. Spring balance. The aneroid barometer and altimeter. Simple manometers and Bourdon type gauges. The use of hydrometers. The simple lens camera with reasons for choice of aperture and shutter speeds. The simple magnifier, construction and use of simple two lens microscope. Principles of a still projector. The photo-electric cell as a light meter and "electric eye". Principles and uses of simple moving coil and moving iron electrical instruments.

COMMUNICATIONS

The nature of sound; velocity, loudness and pitch.

The telephone: construction and action of carbon microphone and earphone. Simple two way circuit with bells. A single triode amplifier used to feed a loudspeaker from a microphone. Brief comparison of the transistor and the valve. Simple moving coil loudspeaker.

ENGINEERING WORKSHOP THEORY AND PRACTICE

GENERAL

It will be assumed that the pupil has the ability to read simple working drawings in isometric and orthographic projection with a knowledge of simple development, and also the ability to sketch tools and ideas in simple diagrammatic views and three dimensional drawing.

FORM OF EXAMINATION

The examination will be in TWO parts:

- (a) a Theory examination of $1\frac{1}{2}$ hours and a Practical examination of $2\frac{3}{4}$ hours (the papers for the Practical examination will be given out 15 minutes before the beginning of the test).
- (b) The allocation of marks will be as follows:

Theory Examination	30%
Practical Examination	50%
Course Work	20%
- (c) The Theory paper will consist of Sections A and B, each of which will carry the same marks. Section A will contain questions requiring short answers. Section B will contain more difficult questions requiring answers at greater length.
- (d) The teacher will be required to make an assessment of the course work completed in the final year.

SYLLABUS

THEORY

1. SAFETY IN THE WORKSHOP. Safety precautions: movement in the shop, clothing, shoes, protective clothing, hair protection, switches, fire and acid precautions, machine guards, starting precautions, lighting precautions, goggles, swarf and cuttings from machines, etc. Tidiness, storage of tools, special precautions using hot molten metals.
2. MEASURING AND MARKING TOOLS. To include use and care of the following: rule, try square, scribe, calipers, dividers, punches, surface gauge, surface plate, V blocks, angle plate, combination set, micrometers (not metric), and gauges.
3. BENCH TOOLS. Files, hammers, mallets, saws, chisels, bench shears, snips, rivet sets, stakes, vices, folding bars, pliers, taps and dies, screw-drivers, spanners, hand drill, drills and reamers.
4. FORGE TOOLS. Hearth, anvil, swage block, fullers, swages, setts, hardies, punches, tongs, smith's hammers, flatters.
5. HARD AND SOFT SOLDERING.
6. MACHINE TOOLS. General consideration of cutting speeds (without calculations), lubricants and coolants. The lathe: its parts and standard accessories. Parallel turning, centre drilling, drilling, knurling, taper turning using the top slide. The drilling machine: main features and construction of sensitive drill, simple methods of holding work.
7. PROCESSES. Preparation of surfaces for marking out. Setting out. Use of bench tools mentioned in (3) above. Forging, hot and cold bending,

twisting, drawing down, fullering, swageing. Sheet metal work, including bending, folding, seaming, and simple wiring. Hardening and tempering, simple casting, annealing, and case hardening, as practised in the school workshop.

8. **MATERIALS.** Properties, recognition and uses of the following: wrought iron, mild steel, tool steel, aluminium, brass, bronze, copper, lead, zinc, tin, stainless steel, cast iron. Simple choice of suitable metals or plastics for specific purposes. Simple outline of the production of iron and steel; the blast furnace, Bessemer converter, electric arc furnace, open hearth furnace and cupola.

PRACTICE

The Practical examination will offer a choice of one from:

- (a) fitting and turning;
- (b) forging;
- (c) sheet metal work;
- (d) turning.

Normally the machines to be used in the practical examination will be lathes and drilling machines, but an offhand grinding machine may be used in the preparation of tools made as examination test pieces.

A cutting list and tool list will be sent to schools in adequate time for the examination.

ENGLISH LANGUAGE

FORM OF EXAMINATION

The examination will comprise:

- (i) Paper I of 1½ hours (40%) with an additional 15 minutes to allow the candidates to read through the paper.
- (ii) Paper II of 2 hours (40%) with an additional 15 minutes to allow the candidates to read through the paper.
- (iii) Spoken English (20%).

Children with speech defects will take a paper in Aural Comprehension instead of Spoken English. In this paper a passage and questions will be read to the candidates who will write the answers. Heads of schools will be asked to notify the Board of any such candidates at the entry stage.

Gradings will be determined on the aggregate mark.

SYLLABUS

PAPER I. UNDERSTANDING OF THE ENGLISH LANGUAGE

It is assumed that, to prepare for this paper, candidates will have followed a course of intensive and extensive study of literature and will have learned to understand, interpret and appreciate imaginative, informative and persuasive writing in books and in the organs of mass communication.

- (i) One passage will always be set to test response to a piece of modern creative writing. If a poem is set for this purpose there will be an alternative prose passage. The questions will be designed to provide opportunities for continuous writing.
- (ii) A passage of prose will always be set to test ability to extract information and/or comment on it. If a question on statistical graphs or tables is set in this section, such a question will be an alternative to this passage.
- (iii) Extracts may be set from newspaper articles, advertisements or any form of prose writing which uses words persuasively.

The use of a dictionary will be permitted in this paper.

PAPER II. EXPRESSION

Candidates will be expected to answer ONE question from each section.

SECTION A

A piece of continuous writing in prose (or poetry) of an imaginative character. The aim of the questions set will be to elicit a lively individual response to a verbal or pictorial stimulus.

A wide choice of subjects will be offered.

SECTION B

- (i) A piece of continuous writing based on information provided.
- OR
- (ii) A piece of writing based on one of a number of situations each of which will act as a starting point for discussion or exposition.

SECTION C

A letter of an informal or semi-formal nature to respond to a situation such as a boy or girl of secondary school age might expect to encounter. There will be a choice of letters.

The use of a dictionary will be permitted in this paper also.

SPOKEN ENGLISH

Spoken English will be examined by internal testing and/or continuous assessment with external moderation. Candidates should show the ability to:

- (a) transmit ideas and feelings,
- (b) describe what has been experienced,
- (c) narrate,
- (d) present and discuss a point of view.

The choice of speech situation will lie with the school. The following suggestions are made.

1. The candidate speaks, after preparation, to a group of his peers on a subject in which he is interested, preferably chosen by himself. If he wishes he may use visual or aural aids. He should speak for about five minutes and be prepared to answer questions.
 2. Discussion of a prepared subject by not more than six candidates with or without an adult leader.
 3. The candidate reads an approved passage of about 200 words from a book of his choice. He introduces the book before reading and answers questions after the reading.
 4. Conversations on various subjects or in various situations.
 5. Improvised or scripted drama.
 6. Magazine or interview on tape.
 7. Debate.
 8. Impromptu talk given by a candidate to a group of his peers.
 9. Dramatised situation for groups of candidates: mock trial, mock interviews, etc.
-

ENGLISH LITERATURE

GENERAL

The syllabus is devised to encourage the richest possible acquaintance with literature in all its forms: Poetry, Prose and Drama. It is hoped that the approach of both teacher and pupil will be along the lines of involvement with people and situations in the works studied rather than along the lines of analytical study and sterile dissection.

FORM OF EXAMINATION

There will be a written paper of 2½ hours preceded by a period of 20 minutes for reading during which candidates may make notes. It will consist of three sections:

- (a) Poetry
- (b) Prose
- (c) Drama

Candidates will be required to answer four questions, not more than two on any one section.

SYLLABUS

SECTION A POETRY

Four questions will be set, each of which will be based on an unseen passage. Two questions will relate to poetry before 1914 and two to poetry from 1914 to the present day. The questions will be so set as to test involvement and invite response: they will specifically avoid linguistic analysis.

SECTION B PROSE

There will be no set books as such. Instead the Board will publish a list of selected books (to be reviewed after three years) in the hope that candidates will answer questions from the widest possible experience of reading from this list. Although questions will be of a general nature, answers will require specific knowledge. The questions may include the following approaches:

- (a) Personal response to situations from the books studied. Unseen material may or may not be provided.
- (b) Showing appreciation of the books studied by developing situations in them to create fresh imaginative material.
- (c) Consideration of and judgments on various themes in prose writing.

SECTION C DRAMA

The examination will proceed along the same lines as that for Prose, with a list of selected plays subject to similar review. In addition to being concerned with themes and characterisation, questions might well reflect experience of these plays on television, on films and in the live theatre.

SELECTED BOOKS

(NOTE.—Where a school edition — e.g. "My Early Life" — or a "cadet" edition — e.g. "The Cruel Sea" — is available, these are recommended. Otherwise, "condensed" versions are not recommended. The details of paperback editions may not be comprehensive.)

English Literature

PROSE

AUTHOR	TITLE	PUBLISHER	PAPERBACK EDITION
M. Allingham	Tiger in the Smoke	Chatto & Windus	Penguin
H. E. Bates	Fair Stood the Wind for France	Michael Joseph	Penguin
C. Bronte	Jane Eyre	(Various)	Penguin
E. Bronte	Wuthering Heights	(Various)	Everyman
A. Burgess	The Small Woman	Evans	Pan
J. Cary	Mister Johnson	Michael Joseph	Penguin
W. Churchill	My Early Life	Odhams Press	—
S. Crane	The Red Badge of Courage	O.U.P.	Collier
C. Dickens	A Tale of Two Cities	(Various)	—
R. Farr	Seal Morning	Hutchinson	Hutchinson
S. Fitzgerald	A Diamond as big as the Ritz and other stories	—	Penguin
A. Frank	Diary of A Young Girl	Hutchinson	Pan
R. Godden	An Episode of Sparrows	Macmillan	—
W. Golding	Lord of the Flies	Faber	Faber
A. Grimble	A Pattern of Islands	Murray	Murray
G. Guareschi	Little World of Don Camillo	Gollancz	Penguin
T. Hardy	Under the Greenwood Tree	Macmillan	Macmillan
E. Hemingway	The Old Man and the Sea	Cape	—
O. Henry	Stories	Gollancz	—
T. Heyerdahl	Kon-Tiki Expedition	Allen & Unwin	Penguin
R. Hughes	High Wind in Jamaica	Chatto & Windus	Four Square
J. Hunt	The Ascent of Everest	Hodder	U.L.P.
D. H. Lawrence	Sons and Lovers	Heinemann	Penguin
L. Lee	Cider with Rosie	Hogarth	Penguin
W. Mankowitz	A Kid for Two Farthings	Deutsch	Consul
G. Maxwell	Ring of Bright Water	Longmans	Pan
N. Monsarrat	The Cruel Sea	Cassell	Pan
G. Orwell	Animal Farm	Secker & Warburg	Penguin
A. Paton	Cry, the Beloved Country	Cape	Penguin
J. D. Salinger	Catcher in the Rye	Hamish Hamilton	Penguin
J. Shaeffler	Shane	Heinemann	Peacock
N. Shute	A Town Like Alice	Heinemann	Pan
A. Sillitoe	The Loneliness of the Long Distance Runner	W. H. Allen	Pan
J. Steinbeck	The Pearl	Heinemann	Pan
J. Tey	A Daughter of Time	P. Davies	Pan

English Literature

AUTHOR	TITLE	PUBLISHER	PAPERBACK EDITION
J. Tolkien	Lord of the Rings	Allen & Unwin	—
M. Twain	Huckleberry Finn	Dent	Everyman
J. Verne	Around the World in Eighty Days	Dent	Everyman
H. G. Wells	The First Men in the Moon	Collins	Fontana
H. G. Wells	The History of Mr. Polly	Collins	Pan
T. H. White	Goshawk	Cape	Penguin
J. Wyndham	Day of the Triffids	Michael Joseph	Penguin

DRAMA

R. Bolt	A Man for All Seasons	Heinemann	French
B. Brecht	The Caucasian Chalk Circle	Methuen	Methuen
J. Bridie	Tobias and the Angel	Constable	Constable
C. Fry	The Lady's not for Burning	O.U.P.	—
J. Galsworthy	Strife	} Duckworth } Modern Plays	—
J. Galsworthy	The Silver Box		—
O. Goldsmith	She Stoops to Conquer	Blackie, etc.	—
A. Miller	The Crucible	Cresset	Muller
A. Obey	Noah	Heinemann	—
S. O'Casey	Juno and the Paycock	Macmillan	Macmillan
G. B. Shaw	— Any play —	Longmans	Penguin
W. Shakespeare	— Any play —	(Various)	—
R. Sheridan	The School for Scandal	Dent	—
R. Sheridan	The Rivals	Dent	—
Sophocles	Antigone	Murray	—
J. Synge	The Playboy of the Western World	Dent	Unwin
D. Thomas	Under Milk Wood	Dent	Aldine
A. Wesker	— The Wesker Trilogy —	Cape	Penguin
O. Wilde	The Importance of Being Earnest	Ginn	—
T. Wilder	Our Town	Longmans	—
—	Medieval Plays	Heinemann	—

FRENCH

GENERAL

The examination will test the candidates' ability to

- (a) understand French when spoken by a native speaker talking on a subject within the candidates' experience and at a reasonable speed;
- (b) reply intelligibly in speech in French to straightforward questions within their experience;
- (c) read aloud with reasonable accuracy and fluency and with good understanding a straightforward prose passage in French;
- (d) understand simple written French;
- (e) express themselves with reasonable accuracy in French in speech and in writing, on subjects within their linguistic experience;
- (f) show some knowledge of the general background of the French people (i.e. geography, history and general life).

FORM OF EXAMINATION AND SYLLABUS

The examination will consist of THREE written papers and an oral examination.

PAPER I GUIDED COMPOSITION

(75 minutes. Marks 25%)

- (a) Question 1. Six episodes or situations will be outlined in French. Candidates must select three of these which they will continue, develop and conclude, each to a length of 30 — 50 words.
- (b) Question 2. Candidates will have the choice of writing *either* a passage of French based on a picture or series of pictures *or* a letter in French on a given subject. In each case 110 — 130 words will be required.

In both questions candidates may use the present tense only, but they will be given higher marks for ability to use a variety of tenses.

PAPER II

(60 minutes. Marks 20%)

- (a) Written comprehension. Marks 15%. Two passages of French will be set. After each passage there will be a number of questions in English which candidates will be required to answer in English.
- (b) Background knowledge of France. Marks 5%. Questions will be set in English on a wide range of topics.

Topics such as the following will form the basis of the examination:

- (i) Outline of French topography (main towns, rivers, mountains, etc.).
- (ii) Outline of French history through the medium of 'great lives' such as Joan of Arc, Louis XIV, Napoleon, Pasteur, de Gaulle.
- (iii) French education, especially as different from our own system.
- (iv) Modern discoveries in science and industry.
- (v) The life of ordinary people, stressing the differences between life in France and in England.

French

- (vi) Transport.
- (vii) The metric system.
- (viii) Paris.
- (ix) French institutions, e.g. republic, départements.

Candidates will be required to answer in English and as briefly as possible questions on a selection of these. A map question may be included.

PAPER III

- (a) Aural test (30 minutes. Marks 15%)
- (b) Dictation (30 minutes. Marks 10%)

The aural and dictation tests will be on tape and given to the candidates by tape recorder. The voices used will be those of a native Frenchman and Frenchwoman.

1. AURAL TEST

Two passages will be set, one spoken by a Frenchman and one by a Frenchwoman.

The test passages will be preceded by a short passage of French read by the speakers about to give the test, in order to accustom the candidates to hearing the speakers' voices. The candidates will be provided with a printed copy of this preparatory passage.

Passage I will be read through; no writing by the candidates will be allowed. Candidates will then be instructed to read carefully the English questions on Passage I printed on their question paper; they should not yet write any answers.

Passage I will then be re-read, section by section. At the end of each section an English voice on the tape will instruct the candidates to answer in English the appropriate questions. They must not start writing until the voice has finished speaking. Passage I will then be read through again at normal speed and the candidates will be allowed time to revise their answers.

The testing of Passage II will follow the same pattern.

2. DICTATION

Two passages will be set, one read by a Frenchman and one by a Frenchwoman.

ORAL TEST

(10 — 12 minutes per pupil)

1. READING ALOUD (marks 10%)

The candidate will be expected to read aloud a passage of 10 to 12 lines which may include a little dialogue. He will have been given some three minutes before the test to study the passage set.

2. CONVERSATION (marks 20%)

The conversation test will consist of certain obligatory questions based on material supplied by the Board, and of general conversation, some of which may be based on the material supplied.

Both 1 and 2 will be tested by the candidates' teacher, who will also assess the marks. A taped record of the whole examination will be sent to the Chief Examiner.

GRAMMAR AND VOCABULARY

The grammar and vocabulary will be that contained in *Le Français Fondamental, premier degré*, with the following modifications:

- (a) Grammar, paragraph 49, should read:
"On enseignera à reconnaître le passé simple, mais on n'enseignera pas le passé antérieur."
- (b) The examiner may include up to five words per running 100 outside the vocabulary of *Le Français Fondamental, premier degré*.

Candidates should feel free to use any further vocabulary or grammar they wish.

GEOGRAPHY

GENERAL

The examination seeks to measure ability and achievement, but not merely that aspect of total performance which may be measured by unseen papers at specified times. It would be to the advantage of most of the candidates for whom the examination will cater, if consideration is given to an assessment of their achievement over a substantial part of the course. This would also enable other qualities to be measured, such as imagination, initiative and perseverance. For these reasons an assessment of course work forms part of the examination.

The work in Geography should have significance for the pupil and should take account of the changing world in which he lives. He should be aware of some of the major problems which face people at home and abroad and try to understand how some of them might be resolved. This much is necessary to read a newspaper with understanding.

The pupil should be observant of the natural and human landscape around him, trained to record it with increasing precision and to seek explanations for what he sees. His conclusions should make him aware of the difference between fact and generalisation. The Board therefore requires every candidate to present a record of field work and in addition he may submit a personal record of some practical investigation.

By the end of the course the pupil should become familiar with some of the main distributions of geographical features and phenomena over the globe, and the knowledge he has acquired is tested with reference to a given world map. The syllabus avoids a catalogue of items in this section so that teachers will not feel bound to devote an undue proportion of the fifth year to a study of remembered facts or the more academic systematic geography.

That part of the syllabus which deals further with world geography does not demand a detailed study of the continents. It seeks rather to give the pupil some picture of the world as a whole by considering a number of topics as they relate to different regions along a broad continental transect.

Where the teacher prefers the study of a chosen continent, it is felt that this can be made more realistic and relevant by following a pattern of concentric studies starting with the consideration in some detail of a small region within a single country. The pupil will be familiar with this approach from the studies which have led outwards from his own home district.

Throughout the course the pupil should be trained in the use of a diversity of source material and should become particularly skilled in the drawing and use of the map. Evidence of such ability is called for over a wide area of the examination.

FORM OF EXAMINATION

The examination will consist of TWO parts:

PART A COURSE WORK (30%)

The presentation, prior to the written examination, of a course work book, loose-leaf file or folder, prepared over a period shortly before the examination (i.e. one or two years).

PART B WRITTEN PAPERS

Paper I The British Isles (including Eire) (35%).

The paper will be of 1½ hours, preceded by 15 minutes reading time. Candidates must answer one question from each of three sections.

Geography

Paper II The World (35%).

The paper will be of 1½ hours, preceded by 15 minutes reading time.

Candidates will be required to answer three questions of which one will be compulsory.

SYLLABUS

PART A COURSE WORK

Some time before the written papers are taken, at a date to be announced, each candidate will submit a course work book or folder which will record two studies.

These must include Section A (20%)
and either Section B (10%)
or Section C (10%)

The amount of course work to be expected from candidates will be left to the discretion of the schools. A thousand words might be taken as an approximate average in each section. This will vary with the topic studied and the nature and quantity of the accompanying maps, diagrams, sketches, specimens, models, etc. More important than quantity will be the quality of geographical content.

Course work will be assessed by the teacher, with guidance from the Board.

SECTION A

FIELD WORK

A personal record of guided field work, carried out on a group or individual basis and not necessarily confined to the home area.

This may involve a number of separate studies or a single extended study, covering approximately five half-days out of the classroom. It will be an individual record of observations made and data collected relating to such topics as relief, drainage, structure, soil, weather, vegetation and human activities. It should show familiarity with Ordnance Survey maps of various scales.

The schools are free to choose any suitable topics for study in the field. The following are merely suggestions and are offered for guidance only.

1. An urban study — site, growth, industry and occupations, commercial and cultural facilities, communications and traffic problems, redevelopment, etc.
2. A village study — location and accessibility, population growth or decline, occupations, buildings and materials, etc.
3. A comparative study of two or more settlements.
4. A farm study — position, size, water supply, type of farming and changes in pattern, buildings, labour, machinery, markets, transport, etc.

Geography

5. An industrial study — site, reasons for location, raw materials, transport, labour force, markets, by-products, changes, etc.
6. The tourist industry, in one resort, along a stretch of coast or inland. Location, amenities, communications, problems of traffic congestion, peak periods, seasonal employment, etc.
7. A coastal survey — tidal observations and problems, sea and wind erosion, river estuaries, silting, navigational hazards, etc.
8. Study of a port — site and natural advantages, dock facilities, traffic, hinterland and communications, problems, developments, etc.
9. Land subsidence due to coal or salt mining — cause and extent of the problem, effect on existing buildings and communications and on future housing and industrial development; meeting the problem.
10. A transport study — roads, railways, waterways, airways. Problems and changing patterns, etc.
11. Water supplies — rivers, lakes, springs, catchment areas, seasonal variations. Special problems of rural villages, large cities, growing needs of industry, etc.
12. A topographical study — measurement of slope, simple soil analysis, field sketching, relationship between rock and landscape, drainage, land use, settlement, communications, etc.
13. Aspects of physical geography — survey of a stream, moorland scenery, coastal features, valley forms, elementary transect work, etc.
14. A survey of local footpaths.
15. Local weather studies and climatic variations — regular observations, recording and summarising of the elements of weather, temperature traverses, frost incidence, rainfall variations, effect on plants, horticulture, etc.
16. Observation of the sky — cloud types, effect of wind direction, changing positions of familiar constellations, elevation of the sun, etc.
17. Fieldwork conducted on school journeys, school camps or visits abroad.

SECTION B

INDIVIDUAL INVESTIGATION

A personal record of a piece of practical investigation carried out by the candidate independently. The investigation should be one requiring precise observation and recording, from which should emerge certain general conclusions.

The choice of subject is left to the candidate and the school, and may derive from a wider field study. A particular aspect of the study might appeal to the pupil for an investigation in greater depth but on a narrower front. Almost all the topics suggested in Section A above would yield a choice of subjects which could be isolated for such an investigation. On the other hand, the subject chosen might reflect the candidate's hobby or particular interest. Fishing or canoeing could suggest a detailed study of a small section of a river; an interest in pot-holing might prompt a study of underground drainage; an interest in trains could usefully lead to a survey of traffic at a rail centre.

Geography

Whilst these subjects demand work in the field, the chosen investigation could alternatively be analogous to that done in a laboratory, where such things as the porosity of soils or a single component of weather could be observed and recorded. Whatever the subject, the investigation should be kept within a narrow focus, illuminating and isolating its conclusions without becoming diffuse and involved in complex relationships.

SECTION C

STUDY OF A CHOSEN TOPIC

A study of a topic of the candidate's own choosing, which should include diagrams, sketch maps, etc., and which should not be similar in content to any topic set elsewhere in the syllabus.

(i.e. It should not relate directly to any of the regions specified for study in the British Isles.

It should not be one of the six topics listed in Section B of Paper II if it relates specifically to any area in the chosen transect.

It should not be part of the three studies of the chosen continent in Section C of Paper II.)

This section of the syllabus will involve the candidate in library research and the use of a variety of source material — newspapers, magazines, radio and television programmes, commercial brochures, official reports, travel books, etc. It is recognised that there is a danger of a candidate merely copying from a book. A teacher can help to avoid this by suggesting topics which are not written up in standard form in textbooks — topics where the emphasis is on change, such as Motorways, The Drift to the South-East, National Parks, New Sources of Power, The New Frontier in Russia, Irrigation in Israel, Population Changes, Industry in Post-War Japan, etc. To suggest and sometimes to provide suitable up-to-date source material on such themes will be the teacher's most difficult task.

PART B WRITTEN PAPERS

"Essay-type" answers required are likely to be short, particularly in Paper I, and both papers will include questions requiring objective answers.

Questions will be designed to test both factual knowledge and deductive reasoning and will demand familiarity with the interpretation of maps (including Ordnance Survey maps), photographs, graphs, statistics and diagrams.

PAPER I THE BRITISH ISLES (including Eire)

The candidate will be required to answer one question from each of the Sections A, B and C. There will be a choice of question in each section.

SECTION A

THE BRITISH ISLES AS A WHOLE

A general appreciation of position, general physical geography, climate and principal factors of agricultural and industrial location.

SECTION B

THE NORTH WESTERN REGION

This covers the Isle of Man, Cheshire and Lancashire, including the southern part of the Lake District. A more detailed knowledge will be required than in Sections A and C.

SECTION C

TWO OTHER REGIONS

An understanding of the geography of two regions other than the North-West, selected from the alternatives given below. Candidates need study only one pair.

For 1966

- (i) East Anglia and the Fens, and South Wales.
- (ii) The South-West Peninsula (Somerset, Devon and Cornwall) and the Central Lowlands of Scotland.
- (iii) Northern Ireland and London and South-East England (Surrey, Sussex and Kent).

For 1967

- (i) Northumberland and Durham, including Tees-side and North Wales (north of the Dee — Mawddach).
- (ii) and (iii) as for 1966.

PAPER II THE WORLD

The candidate will be required to answer the compulsory question in Section A and two others, both of these to be chosen from one of the remaining sections.

SECTION A

WORLD MAP

Factual questions on the world as a whole, with reference to a given map (Mercator or Equal-Area projection). Only one main question will be set but some choice will be offered within the question.

SECTION B

CONTINENTAL TRANSECT

The school will select one continental transect, broadly approximating to a specified routeway, from three offered in the syllabus.

Six questions will be set, one on each of the topics listed below. The candidates will be required to answer any two of the questions, but these must relate to different countries along the chosen transect.

- (i) The study of two contrasting systems of farming.
- (ii) The influence of power resources upon the development of a region.
- (iii) Economic and social problems of a multi-racial state.
- (iv) The development of extractive and manufacturing industries in any one region.
- (v) Patterns of world trade and communications of a country along the transect.
- (vi) Factors influencing the pattern of settlement in any one region.

The topics are relevant to all transects and most of them offer a choice of regions to be studied. It will not be necessary to study the whole transect but, in order to afford the candidate a choice of questions in the examination it is advisable to prepare more than two of the topics.

In any revision of the syllabus not more than three of the above topics will be changed in any one year.

Geography

The transects offered will be:

- EITHER Alaska to Argentina — to include North America west of the Rockies, mainland Central America and South America east of the Andes.
- OR London to Capetown — to include France, Italy, Egypt, the Sudan, Uganda, Kenya, Tanzania, Zambia, Malawi, Rhodesia and the Republic of South Africa.
- OR Siberia to Tasmania — to include Siberia east of the Lena, Manchuria, the Great Plain of China and the lower Yangtse Basin, the South China Coast, Hongkong, Indo-China, Malaysia, Indonesia, Australia (excluding the Northern Territory and Western Australia) and Tasmania.

SECTION C

STUDIES OF A CHOSEN CONTINENT

Schools will select one continent for study as defined below:

North America, Mexico and the Caribbean Islands.

South and Central America (excluding Mexico).

Europe (excluding U.S.S.R.).

Asia (excluding U.S.S.R.).

U.S.S.R.

Australasia.

Africa.

Two questions will be set on each of the three sub-sections listed below, and from the six questions the candidate will be required to answer two, taken from different sections, but relating to one continent. The questions will be so framed as to be applicable to any chosen continent.

- (i) Specimen studies of each of the following: a village, a town, agricultural and industrial units, occupations and land use in a region within a single country.
 - (ii) The physical and human bases of the geographical regions of the country chosen in (i) above.
 - (iii) Natural regions and political divisions in relation to the broad physical features of the continent.
-

GEOLOGY

GENERAL

It is essential that candidates offering this subject will have had instruction in the field and will be required to submit evidence of this work. Pupils will similarly have had access to specimens of the minerals, rocks and fossils listed below.

FORM OF EXAMINATION

There will be ONE written paper of 2 hours and a practical examination of 2 hours.

1. Elementary ideas on the structure of the earth; its crust; sial and sima; mantle and core; the theory of continental drift; the earth's internal heat and age, with some reference to radioactivity.

2. Earth movements. Formation of fold mountains, block mountains and rift valleys and isostatic adjustments.

Earthquakes: local and eustatic changes of sea level (raised beaches, submerged forests and effects on river valleys).

3. Igneous activity. Some types of intrusions (sills, dykes, laccolith, phacolith, stock, boss and batholith).

Vulcanicity: central eruptions (lava, ash and composite cones) and fissure eruptions (lava plateaus).

4. Thermal and regional metamorphism (dynamic metamorphism: metamorphic aureole).

5. The identification of minerals of the earth's crust using physical properties such as cleavage, lustre, colour, hardness, streak and specific gravity; the action of dilute hydrochloric acid as appropriate. Quartz, calcite, feldspar, mica, hornblende, augite, haematite, magnetite, iron pyrites, galena, fluorspar, barytes, gypsum, rock salt, zinc blende.

6. The identification of rocks of the earth's crust including their general characteristics and modes of formation.

(a) Granite, rhyolite, gabbro, basalt.

(b) Conglomerate, sandstone, flagstone, quartzite (sedimentary), shale, mudstone, limestones (including chalk and oolitic limestone), gritstone and breccia.

(c) Slate, marble, schist, gneiss.

7. The formation and occurrence of coal, oil and natural gas.

8. Arrangement of sedimentary rocks; meaning of outcrop and exposure; dip and strike. Folding (anticline and syncline, symmetrical, asymmetrical and isoclinal folds, recumbent folds, nappes and overfold). Faulting (normal, reversed and thrust faults). Outliers and inliers. Unconformities, overlap and overstep.

9. Geomorphology. Weathering: mechanical and chemical. Mass movement (soil creep and landslides). The work of rivers in their youthful, mature and old age stages. Ground water; porosity and permeability, water table, springs and wells, and the special features of limestone areas. Glacial erosion and deposition: effects on drainage. Coastal erosion and deposition.

10. The sequence of the main geological periods. The identification, methods of formation and the value of fossils to the geologist. The diagnostic features

Geology

and time distribution of the following groups; brachiopods, lamellibranchs, graptolites, corals, goniatites, ammonites, trilobites, gastropods, crinoids and Coal Measure plants.

11. The geology, including geological history, of any district, which may include the school area, studied in the field.

PRACTICAL EXAMINATION

1. Identification of hand specimens of the minerals, rocks and fossils listed in paragraphs 5, 6 and 10 above.
 2. The meaning and use of simple geological maps showing structures such as horizontal and inclined strata, simple folds (non-plunging), faults (normal and reversed), igneous intrusions, unconformities. The drawing of sections.
 3. The description and interpretation of photographs of geological features.
 4. Both original notes and written accounts of field work must be submitted; sketches and/or photographs (where applicable) should be included.
-

GEOMETRICAL AND ENGINEERING DRAWING

FORM OF EXAMINATION

The examination will consist of:

- | | | |
|-------------------------|------------|-----|
| (a) Geometrical Drawing | (2 hours) | 30% |
| (b) Engineering Drawing | (2½ hours) | 50% |
| (c) Course Work | | 20% |

Examples of course work completed during the academic year must be available for inspection and will be assessed by the teacher.

Drawing paper of half Imperial size will be used for the Geometrical Drawing examination and for Section B of the Engineering Drawing examination.

The questions set in Paper 1 (Geometrical Drawing) will be limited to those with realistic practical application.

Questions may also be set to test the student's ability to follow a sequence of operations from direct instructions.

SYLLABUS

GEOMETRICAL DRAWING

The syllabus comprises TWO sections:

- A. Basic constructions. Five compulsory questions will be set.
- B. More advanced work. A minimum of five questions will be set of which three must be attempted.
55% of the total marks for this paper will be allocated to Section A and 45% to Section B.

SECTION A

1. Division of a line into equal and proportional parts. Plain scales.
2. Plane figures.
 - (a) Simple construction of triangles, given
 - (i) three sides,
 - (ii) two sides and the included angle,
 - (iii) one side and its two adjacent angles,
 - (iv) perimeter and ratio of sides.
 - (b) Construction of quadrilaterals given sides, interior angles and diagonals.
 - (c) Construction of regular polygons
 - (i) on a given side,
 - (ii) inscribed and circumscribed in or about a given circle (hexagon and octagon only),
 - (iii) the largest octagon in a square.
3. The circle and its parts. Applications. Inscribed and circumscribing circles. Angle in a semi-circle.
 - Tangents
 - (i) at a point upon the circumference;
 - (ii) from a point *outside* the circumference.
 - Lines and circles in contact.

Geometrical and Engineering Drawing

4. Simple construction of an ellipse given major and minor axes.
5. Loci, slider-crank mechanisms only, used as an example in link motions.
6. Isometric (excluding the circle), and oblique projection of simple solids.
7. Orthographic projection of simple solids resting with their axes parallel to, or inclined to one plane only; limited to right square and hexagonal prisms and pyramids or easy combinations of these.
8. Surface development of simple solids limited to objects formed from square, hexagonal and circular prisms only.

SECTION B

1. Properties of the ellipse. Location of focal points. Construction of normal and tangent. Curve parallel to an ellipse.
2. Loci, extension of loci to include parabola and helix and further simple link mechanisms. Construction of cycloid.
3. Pictorial representation of solids, including those with curved surfaces,
 - (a) in isometric projection (excluding use of isometric scale),
 - (b) in oblique projections.
4. Orthographic projection. Extension of Section A (7) to include cylinder and cone.
5. Orthographic views of right solids (as previously listed) resting with their principal axes normal to the horizontal and vertical planes of projection, and cut by inclined planes.
6. Auxiliary projections of these solids. Views to be limited to those drawn with a practical purpose in view, to determine true shapes of surfaces, true lengths of lines, and true values of angles (inclined planes only).
7. Surface development extended to include objects formed from the above solids.
8. Projection and development. Problems relating to the interpenetration of cylinders of equal and unequal diameters whose axes are normal or inclined, and may or may not be in the same plane.

ENGINEERING DRAWING

Standard drawing procedure as set out in the current edition of B.S. 308 must be used.

The question paper will comprise TWO sections.

40% of the total marks for this paper will be allocated to Section A and 60% to Section B.

It will be assumed that the candidate has an elementary knowledge of the following simple engineering details and such knowledge may be tested in either Section A or Section B.

1. FASTENINGS. Rivets and riveted joints. Snap head and countersunk head. Simple single riveted lap joint. Simple single riveted butt joint. Hexagonal headed nuts and bolts. Set screws and studs.

Geometrical and Engineering Drawing

2. LOCKING DEVICES. Lock nut. Slotted nut and split pin. Spring washer. Keys and cotters. Simple sunk key. Simple cotttered joint.

3. SCREW THREADS. Only a conventional representation will be required but a knowledge of the following terms will be assumed.

Pitch T.P.I. B.S.W. B.S.F. B.A.

SECTION A

This Section will be presented in the form of a printed schedule aimed at testing the following points;

- (a) freehand sketches expressing interpretation of a given drawing,
- (b) freehand sketches showing knowledge of functional design,
- (c) objective answers framed to assess as quickly as possible the ability to interpret a drawing,
- (d) sketching or drawing from a photographic reproduction, from a solid object, or from a pictorial view,
- (e) ability to select correct views presented in the form of multiple choice tests.

Candidates will be advised to spend about half an hour on this Section.

SECTION B

The solution will be required to be drawn full size, in first or third angle orthographic projection.

The example will be a simple machine part or parts which may require assembly.

Students should be given opportunity for production of drawings from given pictorial and orthographic views but in the first instances the examination question will be presented mainly as a pictorial view.

The candidate should be capable of constructing elevations, plans and full sectional views with knowledge of treatment of hidden details.

Attention should be given to lay-out, clear and systematic dimensioning and neat lettering.

GERMAN

GENERAL

The examination will be designed to test the candidate's ability to communicate in simple German within his own experience:

- (i) by the spoken word,
- (ii) by understanding the spoken word,
- (iii) by being able to correlate what he hears with what he writes,
- (iv) by writing in German,
- (v) by understanding written German.

FORM OF EXAMINATION

Oral Test	To last not more than	15 minutes	30%
Paper I	Dictation	30 minutes	10%
	Aural Test	30 minutes	15%
	Free Composition	45 minutes	20%
Paper II	Comprehension	} 75 minutes	10%
	Translation		15%

ORAL TEST

All candidates will be required to take an Oral Test comprising:

(i) a reading test, (ii) set questions based on the reading passage, (iii) a conversation test.

- (a) The candidate will be allowed five minutes to read the passage before the start of the test. The reading passage will take the form of a dialogue. The opening sentences will be read by the examiner, the dialogue will be shared with the candidate and the conclusion will be read by the candidate. Candidates will retain the printed passage during the remainder of the Oral Test.
- (b) Questions will be read by the examiner as printed. If no answer is obtained the examiner may re-phrase the question. The answers need not be in complete sentences.
- (c) The examiner will engage the candidate in general conversation at the candidate's own level on general topics or on matters arising from the reading passage. Suggested topics for conversation are school, hobbies, holidays, the home, career, division of a normal day, a Saturday afternoon, etc.

PAPER I

DICTATION TEST

- (a) The passage will be read *once* by the teacher before the candidates are allowed to write anything.
- (b) The passage will then be dictated in sections as marked, each section being repeated after the candidates have had time to write it down.
- (c) The passage will be read a fourth time as a whole, after which the candidates will be allowed five minutes to check what they have written.
- (d) Punctuation will be given in German.
- (e) Proper nouns will be written on the blackboard.
- (f) After the Dictation Test candidates' scripts will be collected before the start of the remainder of Paper I.

German

AURAL TEST

A passage will be read twice in German to the candidates who will have before them questions, in English, on the passage. Candidates will then be allowed 15 minutes in which to answer the questions in English. The passage will then be read a third time and 10 minutes allowed for the candidates to check what they have written.

FREE COMPOSITION

Candidates will be required to write in not less than 100 words either a narrative using a picture as a guide or the story suggested by a series of pictures. Considerable freedom will be allowed in the use of tenses.

PAPER II

COMPREHENSION TEST

This will consist of a passage in German followed by a number of questions in English. 30 minutes will be allowed for answers in English.

TRANSLATION

The passage for translation will be of a practical nature (e.g. a recipe for girls, details of a construction kit for boys). A dictionary supplied by the school may be used in this test.

GOVERNMENT AND CITIZENSHIP

GENERAL

The aim of the course is to enable the pupil to discover and examine the rights and obligations of the individual within the local community and the national state, so that he may in due course act as an informed and interested citizen within organised society.

The Board envisages a course of not less than two years' duration, the pupil spending at least $1\frac{1}{2}$ hours per week upon class work, with additional time devoted to individual project work. The aim of the course is to be achieved by studying in broad outline the institutions of the state, the working of Government at local and national level; the enforcement of law and order and the provision of services through rates and taxes, and by voluntary bodies. Pupils should be encouraged to make intelligent use of information from the press, television and the radio, and to be alive to political bias. The syllabus is both broad and diverse in content, hence

- (a) compulsory questions will not be asked upon the historical development of any topic in the syllabus;
- (b) opportunity will be given in his individual project work for the pupil to pursue his studies more deeply than will be required for the written paper.

The final grading of the pupil will be determined by his performance in the written examination, together with an assessment of the project work he has presented.

FORM OF EXAMINATION

The examination will comprise a written paper of 2 hours (70%) and individual project work (30%).

SYLLABUS

LOCAL GOVERNMENT IN ENGLAND AND WALES (EXCLUDING LONDON)

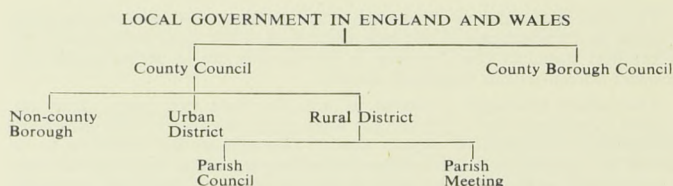
A personal, and, where possible, firsthand approach is desirable, beginning with individual experience within the pupil's own local community and leading to the study of the organisation and services of all types of Local Authority.

1. YOUR OWN LOCAL AUTHORITY OR AUTHORITIES

- (a) The services provided: Social, communal, environmental, protective, trading. Liaison with voluntary bodies, e.g. Women's Voluntary Services, St. John's Ambulance Brigade, The Rotary Movement.
- (b) How these services are paid for: Rates, government grants, revenue from trading services, loans.
- (c) The Local Council: Membership, election, meetings, business, chairman, aldermen, committees, paid officials, employees, bye-laws.
- (d) Joint Authorities: Transport, water, docks.
- (e) How the Central Government gives Local Authorities their powers and how it supervises their work.

2. OTHER TYPES OF LOCAL AUTHORITY

This leads to the overall picture of



PARLIAMENT

The aim of this and the next section of the syllabus is to acquaint the pupil with the organisation and working of the Government at national level.

1. THE ELECTORAL SYSTEM. Electorate, constituency, candidates, machinery of electoral organisation and result.
2. THE POLITICAL PARTIES. Reasons for existence, principles of main parties.
3. THE HOUSES OF PARLIAMENT
 - (a) Composition and officials of the Lords and Commons: Speaker, Lord Chancellor, Leaders, Whips, etc.
 - (b) Functions: Legislation, financial control, provision of a government and opposition. Work and responsibilities of an individual M.P. in Parliament and in his constituency.

THE CENTRAL GOVERNMENT

1. The appointment and work of the Prime Minister. The composition, functions and responsibility of the Cabinet.
2. How major Government Departments work. The Minister and the Civil Service (appointment and structure).
3. Income and expenditure.
4. The local offices of Central Government, e.g. Ministry of Pensions and National Insurance, Ministry of Labour.
5. The constitutional, social and Commonwealth functions of the Monarchy
6. The influence of public opinion and pressure groups.

THE LAW IN ENGLAND AND WALES

A general understanding of the basic principles involved in the syllabus is required rather than knowledge of minor variations and legal subtleties.

It is assumed that the course will include at least ONE visit to any court in session.

1. How a case is dealt with from summons, arrest or writ and appearance in court,
 - (a) before a Magistrate (including a Juvenile Court Magistrate);

Government and Citizenship

- (b) before a County Court Judge;
- (c) at Assizes, Quarter Sessions and Crown Courts.

Trial by jury. How the courts ensure a fair trial. Nature of proof and evidence. Solicitors and barristers. Legal Aid. Appeals. Penalties for civil and criminal offences imposed by courts. Probation Service.

2. Liberties normally accorded to the citizen: Freedom of speech; freedom of worship; right of public meeting; freedom from arrest; freedom of the press. Legal duties of the citizen. Outline knowledge of the rights of groups of citizens within the law. Privileges accorded to certain groups for combination and corporate activities and trade. Public corporations.

3. How law is made: Statute and Common Law; Ministerial Orders and other delegated legislation, e.g. Local Authority Bye-Laws.

4. The independence of the courts and the supremacy of law. Equality before the law.

5. Tribunals and enquiries. Some awareness, at local level only, of the activities of quasi-judicial bodies is required.

INDIVIDUAL PROJECT WORK

During his final year the pupil will make a detailed practical study of some relevant topic. This topic may either be taken from the list of suggested topics given below or be chosen by himself provided the subject is approved by his teacher.

The project should follow a coherent scheme, which should be clearly set out as a preface, and should include a bibliography, a list of sources, a list of visits made and a statement of any other fields of personal investigation. It may consist of a written account, supplemented by maps, models, diagrams, literature, photographs, recordings and expressions of opinion, presented in an orderly and attractive manner in book, folder or other suitable form.

SUGGESTED TOPICS

1. Any one Local Government service.
2. Any one type of court.
3. Any one Government Department.
4. Any one public corporation or pressure group.
5. Any one example of an international political, economic or cultural organisation.
6. Any one social problem.
7. Taxation.
8. A trade union.
9. The struggle for women's rights.
10. Interesting traditions surviving in Parliamentary procedure, or Local Government, or the Legal System.
11. The Commonwealth activities of the Royal Family.
12. Earning, saving and spending at personal, local and national level.
13. Local Government Boundary Commissions.
14. One other national Government.

HEALTH EDUCATION

GENERAL AIMS OF THE COURSE

To bring the pupil to understand and control his or her own body and mind for the purpose of healthy living.

To equip the pupil with adequate knowledge to enable him or her to enjoy bodily and mental health.

To develop an awareness of the factors influencing the health of the individual in his or her immediate environment, the community and the world in general.

It is envisaged that the length of the course will be two years. It is expected that attention will be given to experimental techniques and observations and questions will be set to test these aspects of the course.

FORM OF EXAMINATION

The examination will be in two parts, a written paper and a piece of individual work chosen by the candidate. Marks will be allocated as follows:

Written Paper	80% (Part A 40%, Part B 40%)
Individual Work	20%

The written paper will be of 2½ hours and in two sections, A and B, each covering both parts I and II of the syllabus. Section A, which will be compulsory, will consist of questions requiring short answers, and in Section B candidates will have a choice of four questions out of seven requiring more detailed answers.

It is expected that the individual work covered in Part III of the syllabus will be completed by the end of the first term of the last year of the course.

SYLLABUS

PART I GENERAL PHYSIOLOGY AND PERSONAL HYGIENE

1. SIMPLE STRUCTURE OF LIVING CELL.
2. THE SKELETAL SYSTEM.
 - (a) The skeleton and its functions.
 - (b) Joints and muscles in relation to simple movement of a limb.
 - (c) Good posture, muscle tone and fatigue, exercise and rest, care of the feet.
3. THE CIRCULATORY SYSTEM. Composition and functions of the blood. Blood cells and their origin. Blood groups. The heart, its position, structure and function. General structure and functions of the principal blood vessels. Regulation of heart rate and pulse. Coagulation of the blood and repair of tissue. Lymph.
4. THE RESPIRATORY SYSTEM. The mechanism of breathing. Lungs; tissue respiration and energy. Difference between inspired and expired air. Importance of nasal breathing. Micro-organisms and infections of the respiratory tract.
5. THE DIGESTIVE SYSTEM AND FOOD. The structure and functions of the alimentary canal and associated organs. Enzyme action as illustrated experimentally by ptyalin and pepsin. The importance of regular habits and cleanliness. Structure, functions and care of the teeth. Food, basic requirements in relation to age and occupation. Need for a balanced diet.

Health Education

6. **THE EXCRETORY SYSTEM.** Simple structure and functions of the kidneys, lungs, skin and liver in relation to excretion. Good habits relating to excretion.
7. **THE REPRODUCTIVE SYSTEM.** Position, structure and functions of the reproductive organs. The menstrual cycle, ovulation, fertilisation and an outline of development to include implantations. The functions of the placenta (no detailed structure required). Parturition, mammary glands and milk. Relevant points of personal hygiene.
8. **THE NERVOUS SYSTEM.** A study of the nervous system, including the brain and spinal cord and the sense organs. Voluntary and reflex actions.
A simple study of endocrine glands, hormones and their functions.
Personal care of eyes, ears and nose—the early recognition of defects and simple understanding of the methods of their correction.
9. **THE SKIN.** The structure and function in relation to body temperature and its regulation. Personal cleanliness, grooming. Suitable clothing.

PART II HEALTH AND THE COMMUNITY

1. **DISEASE.** Micro-organisms and infection. Resistance of the body. Natural and acquired immunity. The spread, control and preventive measures. Epidemics. Notifiable diseases. The influence of the work of Pasteur, Lister, Jenner and Fleming.
2. **PUBLIC HEALTH.** Water supplies, sources, pollution and treatment. Sanitation, sewage and refuse disposal. Control of pests, parasites and vermin. Heating, ventilation and lighting of public and domestic buildings. Clean air.
3. **FOOD.** Preservation, contamination. Cleanliness in the handling of food including milk.
4. **HEALTH SERVICES.** An awareness of the facilities which are available through the national and local health services.
5. **STANDARDS OF LIVING THROUGHOUT THE WORLD.** The effects of social conditions on physical and mental health.
6. **EFFECTS OF DRUGS, ALCOHOL, SMOKING AND VENEREAL DISEASE ON THE INDIVIDUAL.**

PART III

Each candidate must submit an individual piece of work concerned with Parts I and II and the general aims of the course. The candidate may be expected to answer questions orally on the piece of work submitted or demonstrate practically (e.g. in First Aid mouth to mouth resuscitation).

SUGGESTIONS

1. World Health Organisation.
2. First Aid.
3. Mothercraft.
4. Home Nursing.
5. Public Health.

Health Education

6. Hospital Services.
7. Effects of Pesticides, Insecticides and Artificial Fertilisers.
8. Nutrition.
9. A more detailed study of the contribution of eminent person(s) concerned with the improvement of health.
10. Accidents in the home.
11. Exercise and recreation.
12. Industrial Health.

These topics are suggestions only and the candidate is free to choose any other topic covered by the syllabus.

HISTORY

GENERAL

While each of the five sections which follow is intended to be complete in itself, some teachers may wish to teach items from two or more of them. They have therefore been drawn up on a "topic" basis, each section containing several distinct topics, on each one of which there will be a choice of questions. Any pupil, therefore, who has covered five topics at least, however chosen, should be able to answer the necessary five questions.

However, a paper of questions on all five sections, totalling perhaps over one hundred questions, might be confusing. The syllabus will therefore be divided into groups, Sections A and B in Group I, Sections C, D and E in Group II. Normally, a school will ask for papers in one group. Any school can ask for both groups if this would better suit its teaching syllabus.

THE OPTIONAL PROJECT

A detailed study of any historical subject may be submitted in addition to the written paper. It will be for the teacher to decide whether his candidates should offer project work. If such an optional project is submitted, the mark awarded will be added to the written paper so that it counts for 25% of the final mark. Projects must be of such a type that they will test historical ability rather than other skills. Candidates must be entered for a project at the time they are entered for the examination, and only in exceptional circumstances will subsequent withdrawal of a project be permitted. The project must be prefaced by a short statement of its aims, and should include a written account (approximately 2,000 to 3,000 words), supplemented by maps, diagrams, and other illustrative material where appropriate. A list of sources should also be given. It is expected that teachers will advise pupils on sources, planning and presentation. While choice of subjects for projects must be left to teachers, the following general suggestions, which are not intended to be exhaustive, may provide some guidance:

Biographies of national or local personalities.

Local History: including the history of local institutions, e.g. schools, churches, etc.

Inventions: particularly the development of local industries.

Detailed study of the way of life of people in any one past period.

The Subject Panel feel that, until standards are set, it would be difficult to mark course work and oral work. Consideration of the inclusion of these has therefore been postponed for two years.

FORM OF EXAMINATION

The written paper will be of 2½ hours. The first 15 minutes will be used by the candidates to study the question paper. They will then be required to answer five questions each of which may be taken from any part of the paper without restriction.

Group I	Section A:	The Middle Ages
	Section B:	The Early Modern World
Group II	Section C:	The Development of Modern Britain
	Section D:	The British Empire and Commonwealth
	Section E:	The Great Powers and the Modern World.

SYLLABUS

GROUP I

SECTION A THE MIDDLE AGES

1. PRE-NORMAN ENGLAND. Saxon invasion and settlement: the Heptarchy, Triarchy. Danish invasion and first conquest; Alfred the Great; the supremacy of Wessex; second Danish conquest; Canute's Empire; Edward the Confessor; Wales and Scotland.

History

2. PRE-NORMAN ENGLAND. Anglo-Saxon religion: Paganism; The Early Christian Church: Celtic Christianity, the conversion, the Synod of Whitby, Theodore of Tarsus, Bede and Dunstan. Anglo-Saxon culture: literature—the Anglo-Saxon Chronicle, drama; Art and Architecture. Law and Order: methods of trial and punishment. The organisation of Anglo-Saxon communities: farming methods; the effects of the Danish conquest.
3. NORMAN ENGLAND. The Norman Conquest: feudalism, the Domesday survey, the Norman Kings, the civil war in Stephen's reign. Norman relations with Wales and Scotland.
4. NORMAN ENGLAND. The manorial system: origin, development. The Church: reform under William I and Lanfranc, the Investiture Dispute—Lanfranc and Anselm, monastic life. Administration and Justice: the Great Council, trial by combat, itinerant justices, jury system. Architecture, transport, coinage, heraldry, amusements, dress.
5. ENGLAND IN THE LATER MIDDLE AGES. The Angevin Kings. The Origins of Parliament: John and Magna Carta, Henry III and Simon de Montfort, the Parliaments of Edward I. The Conquest of Wales, and failure to conquer Scotland. The Hundred Years War. The Wars of the Roses. The Church in the later Middle Ages: Becket, Langton, Grosseteste; Wyclif and the Lollards.
6. ENGLAND IN THE LATER MIDDLE AGES. The decay of the Manor: the Black Death, the Peasants' Revolt, commutation enclosures. Medieval warfare: armour, weapons, castles. Growth of towns and trade: fairs and markets, Merchants and Craft Guilds, the wool trade, domestic industry, the Merchant Adventurers. Education: grammar schools and universities. Literature and printing: Langland, Chaucer, Caxton. Architecture: Early English, Decorated, Perpendicular.
7. MEDIEVAL EUROPE. Mohammed and the rise of Islam, Charlemagne: the Carolingian Empire. Viking exploration and settlement. The Holy Roman Empire. The struggle for supremacy between Empire and Papacy: Hildebrand, Innocent III. The Crusades, chivalry — Barons, Knights and Squires. The origins of France — Philip Augustus. Origins of Christian kingdoms in Spain.
8. MEDIEVAL EUROPE. Medieval trade routes — Marco Polo. The Hundred Years War — Joan of Arc. The decline of the Papacy: Babylonian captivity, the Great Schism, heresy and the Inquisition. The Jews in Medieval Europe. Venice and Italian City States. Rise of Ottoman Turks and collapse of the Eastern Empire. Decline of Islam in Western Europe. Swiss Confederation. Hanseatic League. Growth of House of Habsburg.

SECTION B THE EARLY MODERN WORLD

TUDOR AND STUART ENGLAND

1. THE GREAT AGE OF DISCOVERY. Prince Henry the Navigator and the achievements of all the great explorers from Diego Cam to Hudson. The Spanish-Portuguese hegemony and the English exploration of the North-East and North West passages, slave-trading and piracy. Caravels, scurvy and cartography.
2. THE RENAISSANCE. The Italian Background. The spirit and origins of the Renaissance. The life and work of Petrarch, Machiavelli, Giotto, Leonardo da Vinci, Michelangelo, Raphael and Cellini. The new scientific ideas of Copernicus, Galileo, Kepler, Newton and Harvey.

History

3. THE REFORMATION AND COUNTER-REFORMATION. Wycliffe, Hus. The printing press and the rise of the vernacular. Luther's life and influence. Calvin's life and influence. The life and aims of Loyola. The Society of Jesus.
4. THE STRUGGLES BETWEEN THE POWERS. The struggle between England and Spain; the crippling of Germany in the Thirty Years' War; the rise of France (especially under Richelieu and Louis XIV) and the struggles between England and Holland and France (up to 1713).
5. THE DOMESTIC PROBLEMS OF THE TUDORS. The consolidation of their royal power. Dynastic, religious, agrarian, currency and social problems.
6. THE PURITAN MOVEMENT AND THE RISE OF PARLIAMENT. The growth of Puritanism, the Civil Wars, the Commonwealth, the Restoration, the persecution of the Non-conformists and Covenanters. The 1688 Revolution and the Revolutionary Settlement in Britain and Ireland.
7. SPECIAL STUDY OF ELIZABETHAN ENGLAND. Buildings, dress, customs, theatre, church, schools and universities. Life as led in towns, at sea, in the country, and by paupers.
8. SPECIAL STUDY OF RESTORATION ENGLAND. Buildings, dress, customs, communications, churches, schools, universities, the Royal Society, literature and drama. Lives of George Fox, Samuel Pepys and Isaac Newton.

GROUP II

SECTION C THE DEVELOPMENT OF MODERN BRITAIN

Social and Economic History. 1700 to the Present Day.

1. INDUSTRIAL AND AGRARIAN CHANGES IN THE 18TH CENTURY.

Population — town and country. The domestic system in industry. Coal mining; the problems of deep mining. The advent of steam power: Newcomen and Watt. Iron and steel: the work of the Darbys, Huntsman, Wilkinson and Cort. Textiles: inventors and inventions in spinning, weaving and finishing. 18th Century factories.

The Old Farming: its methods, its shortcomings. The demand for more food. Enclosures: economic and social effects. The New Farming: work of Tull, Townshend, Bakewell and Coke.

2. TRANSPORT CHANGES 1700-1850.

State of the roads at the beginning of the 18th Century. Road improvement: turnpikes, work of Macadam and Telford. Canals: work of Brindley and Telford; advantages; decline. The Railway Age: the pioneers, work of George and Robert Stephenson, I. K. Brunel and the wide gauge, beginnings of Government regulation, social and economic effects. Ships: from sail to steam.

3. THE SOCIAL IMPACT OF THE INDUSTRIAL REVOLUTION.

Difficulties of the craftsman: the Luddites. Conditions in factories and mines: work of Owen and Shaftesbury, the Factory Acts. Methodism: the work of Wesley. Conditions in the new industrial towns — the work of Chadwick, Public Health Acts of 1848 and 1875. Pauperism: Speenhamland System and its consequences, the New Poor Law of 1834. Early Trades Unionism: Combination Acts and their repeal, the G.N.C.T.U. and its collapse. The Co-operative Movement.

4. THE POLITICAL CONSEQUENCES OF THE INDUSTRIAL REVOLUTION.

The 18th Century Parliamentary System. Wilkes and reform. The effect of the French Revolution. Political repression: Peterloo and the Six Acts. The Reform Bills, Chartism, the Suffragettes. The reform of Local Government. The workings of modern government. The coming of Free Trade: Adam Smith, Pitt, Huskisson, Peel and the Corn Laws, Gladstone, the Cobden Treaty.

5. INDUSTRIAL AND AGRARIAN CHANGES SINCE 1850.

The Repeal of the Corn Laws and the period of "high farming", the depression. The 20th Century Revival: adjustment to new conditions and effect of the two World Wars, Government help, the new scientific farming.

England the "World's Workshop" — cotton, coal, steel, the work of Bessemer, Siemens, Gilchrist, Thomas. Twentieth century problems: foreign competition, the effect of the two World Wars, the slump of 1929, industrial inertia.

Twentieth century changes: combines, return to protection after 1931, nationalisation, the new Industrial Revolution, automation.

6. TRANSPORT AND COMMUNICATIONS SINCE 1850.

Development of shipping. The petrol engine: The Motor Car Revolution, its social effects; the development of aircraft and air travel. Electricity: its effect on social life: the growth of the mass media of communication, radio, television. The growth of the popular press — Northcliffe and Beaverbrook.

7. TRADE UNIONS AND THE GROWTH OF THE WELFARE STATE.

The "New Model" unionism of the 1850's and 1860's. Growth of the unskilled workers' unions after 1880, their Socialism. Clarification of Union legal status: Acts of 1871 and 1875, Taff Vale Case and Act of 1906, Osborne Case and Act of 1913. The General Strike and its consequences: Acts of 1927 and 1947.

The growth of the Labour Party — its links with the trade unions. The beginnings of the Welfare State: work of Charles Booth and Seebohm Rowntree, Liberal legislation 1906-1914, its growth. Labour legislation 1945-1950.

8. EDUCATION AND SCIENCE.

The development of public education: the church societies, monitorial system, "payment by results", Education Acts of 1870, 1902, 1944, developments since 1944.

Developments in medicine and surgery: the work of Jenner, Pasteur, Young, Simpson, Lister, Röntgen and Fleming.

9. A COMPARISON OF LIFE IN TOWN AND COUNTRYSIDE IN 1700, 1851 AND NOW.

SECTION D BRITISH EMPIRE AND COMMONWEALTH

1. INDIA.

The East India Company: rivalry with the Dutch; Dupleix and the French challenge; Clive, Warren Hastings and the Wellesleys; the India Act, 1784; Bentinck and Dalhousie; further expansion; the Mutiny.

Provincial self-government; India in the first World War; the Congress Party, Gandhi and Nehru; Jinnah and the Moslem League; the Princes; the failure to find an agreed solution in the 30's; India in the Second World War; independence and partition; Ceylon and Burma.

Political, social and economic problems of contemporary India and Pakistan.



2. AFRICA AND THE MIDDLE EAST.

Exploration and early European settlement: Bruce, Burton, Park, Livingstone, Stanley. The Slave Trade and its abolition, West African settlements, the Cape.

Expansion and development: the Great Trek, diamonds and gold, South Africa Company, Cecil Rhodes, Lugard, development and settlement in Kenya and Uganda, the Suez Canal, British in Egypt to 1914, Baring, Gordon, Kitchener in the Sudan, development of the Sudan.

Independence, South Africa: events leading to the Boer War, the Boer War, Union of South Africa, Smuts, Hertzog, Republicanism, Malan, Apartheid, African National Congress, South Africa leaves the Commonwealth.

Egypt: from the Wafd to Nasser, economic problems, Suez crisis. Oil and Arab nationalism, Palestine into Israel.

West Africa: Ghana and Nigeria.

Central Africa: Central African Federation and its break-up. Problems of independence: frontiers and European settlement.

3. AUSTRALIA AND NEW ZEALAND.

Exploration of Australia: Cook, Flinders and Bass, Sturt, Eyre, Burke, Stuart. Early settlement and development of the six Australian states, sheep farming, wheat, gold discoveries, responsible government.

Modern Australia: formation of the Dominion, systems of Government, problems of communication and defence, "White Australia Policy", economic achievements and problems, growing industrialisation, the "Empty North", population problems.

Cook, the Maoris, Waitangi, the Canterbury Association, responsible government, the Maori Wars, Sir George Grey, Dominion of New Zealand, economic problems, dependence on agriculture and the British market.

Welfare policies in Australia and New Zealand.

4. BRITISH NORTH AMERICA BEFORE 1783.

The New England colonies; economic and social development. Virginia, the other plantation colonies; economic and social development.

Importance of Dutch colonies, their conquest, Pennsylvania. The struggle with France: Utrecht 1713; Duquesne; Amherst and the conquest of Canada.

Causes of the War of Independence; its course; reasons for American victory.

5. BRITISH AMERICA AFTER 1783.

(a) CANADA. The Quebec Act; Empire Loyalists; problems of government; 1791 Act; demand for responsible government; Rebellions of 1837; Durham Report and responsible government; frontier treaties 1842 and 1846; British free trade and Canada; gold and British Columbia; Dominion of Canada Act 1867; how Canada is governed.

Problems of the New Canada; Red River colony; Riel rebellions; C.P.R.; prairie provinces; the grain route; the North West territories, Newfoundland.

Modern Canada: population problems; development of the Great Canadian Shield; relations with U.S.A.; British and European markets.

(b) WEST INDIES. Early development; abolition of slavery and its results; movement towards Crown Colony status; economic problems; problems of federation; independence; relations with U.S.A.; emigration.



6. IRELAND.

(a) VIOLENCE AND NEGOTIATION UNTIL 1914: Act of Union and its background; O'Connell and emancipation; the Disestablishment. Land hunger; problems of tenancy; Great Hunger 1845-7; Land League; Land Acts; Coercion. Fenians; Parnell, Redmond and Home Rule; Ulster.

(b) VIOLENCE AND INDEPENDENCE: Casement; Easter Week Rebellion. Sinn Fein; I.R.A. and "Black and Tans"; North of Ireland; the Treaty, 1921 and the Free State Act; de Valera versus Cosgrave; Civil War; Fianna Fail; complete break with Great Britain; Tariff war 1932-8; economic development; Eire; the treaty ports, 1938; Eire and the second World War; remaining problems of Anglo-Irish relations.

7. INTER-COMMONWEALTH AFFAIRS.

The Old Colonial System. Empire into Commonwealth. Imperial free trade; Colonial Conferences; Statute of Westminster; Ottawa and Imperial preferences. The Dominions and two World Wars; mandates and the League. Meetings of Dominion Prime Ministers; growth of non-European Dominions; Great Britain, the Commonwealth and the Common Market.

SECTION E

THE GREAT POWERS AND THE MODERN WORLD

This section of the paper is designed to include a study of a development of individual powers as well as the relations of the powers with one another. To avoid overlap with Section C, the development of Great Britain has not been included.

THE GREAT POWERS

1. U.S.A. The War of Independence and the constitution. Western expansion. The Civil War. Industrial development in the late 19th century. The extension of United States influence in the Americas and the Pacific. Woodrow Wilson and the First World War. American isolation in the inter-war years. Herbert Hoover and the Great Depression. Franklin Roosevelt and the New Deal. The Second World War. Problems at home and abroad since 1945.

2. U.S.S.R. Background to revolution: the Czarist regime and opposition to it; attempts at reform; the Russo-Japanese War, the 1905 Revolution. The 1917 Revolutions. Civil War. Lenin: the first constitution and the N.E.P. Stalin: collectivisation and the Five-Year Plans, the purges, the second constitution. Relations with the West. The Second World War. Reconstruction after 1945. Khrushchev and the Twentieth Congress.

3. FRANCE, GERMANY AND ITALY AFTER 1870. The revolutionary and nationalistic background.

Background to the collapse of the Third Republic in France. De Gaulle.

The rapid industrial development of Germany after 1870. State Socialism. The Navy League and colonial expansion. Germany and the First World War. Revolution and the Weimar Republic. The rise of Hitler. Nazi Germany. Germany and the Second World War. Defeat and division. The economic miracle.

Instability in Italy after 1870. The rise and fall of Fascism. Political and economic problems of Italy since 1945.

4. CHINA AND JAPAN. European penetration of China. The rise of modern Japan. The Chinese Revolution 1912. The Kuomintang: Sun-Yat-Sen and Chiang-Kai-Shek. Japanese imperialism in the 1930's. The Second World War. Japan since 1945. China since 1949.

THE RELATIONS OF THE GREAT POWERS.

5. THE FIRST WORLD WAR AND THE PEACE SETTLEMENTS.

- (a) The Coming of the First World War: late 19th Century imperialism, the Far East, the Eastern Question, the formation of the Armed Camps, crises to 1914.
- (b) The First World War, 1914-18: main features of the land and naval campaigns, American intervention, defeat and collapse of the Central Powers.
- (c) Peacemaking, 1919-23: the "Big Four", idealism versus realism, the territorial settlement, war guilt, reparations, the mandate system, founding of the League of Nations.

6. THE INTER-WAR YEARS AND THE SECOND WORLD WAR.

- (a) The Inter-War Years: the League of Nations, reparations and relations with the Weimar Republic, collective security, economic depression, the U.S.S.R. and the West.
- (b) The Coming of the Second World War: the breakdown of collective security and the challenge to the League by the totalitarian powers. Aggression versus appeasement. The principal crises: Manchuria, Abyssinia, the Rhineland, Spanish Civil War, Austria, Czechoslovakia, Poland.
- (c) The Second World War, 1939-1945: main features of the campaigns on land, sea and in the air in Europe, North Africa and the Far East. Allied conferences during the war. The Peace of Potsdam.

7. THE INTERNATIONAL SCENE SINCE 1945.

- (a) The Cold War: nuclear weapons and the military pacts, peaceful co-existence. The objects and organization of the United Nations Organization and a comparison with the League of Nations. The major crises since 1945.
- (b) Nationalism and the emergent nations: their problems and role in international affairs as non-aligned states.
- (c) Interdependence: international co-operation through the United Nations, the Colombo Plan, attempts to achieve West European unity.

MATHEMATICS

Candidates who offer Arithmetic may not be presented for this subject in the same year.

GENERAL

This syllabus should be interpreted in such a way that pupils gain enjoyment, satisfaction and confidence from their mathematical studies. Stress is laid on real understanding of concepts and of essential techniques and it is hoped that work in schools will lead to the knowledge of a wide range of mathematical language and ideas, to some realisation of the patterns and relationships of mathematics and to the ability to think in a mathematical way about the many relevant aspects of the modern world.

The common core consists of basic ideas round which schools can evolve considerable and varied expansion of mathematics. It is recognised that it is neither desirable nor possible to frame an external syllabus which will allow for all worth-while developments; therefore flexible arrangements for optional studies have been devised.

The examination will be primarily designed to enable candidates to display their understanding of ideas and of manipulative procedures and their ability to apply knowledge and skills, rather than to test the mechanics of the procedures themselves.

Any syllabus and form of examination produced in accordance with the aims of the Certificate of Secondary Education must be to some extent experimental. It may well be found desirable to alter both syllabus and form of examination, in detail or in substance, in the light of experience gathered during the first two or three years. Meanwhile it is hoped that no school will feel restricted by them and that every encouragement will be given to the liberalising of both teaching methods and subject matter.

FORM OF EXAMINATION

The examination will comprise:

- (a) Paper 1 of 1½ hours (30%),
- (b) Paper 2 of 2 hours (35%) preceded by five minutes reading time,

For the remaining 35% of the marks candidates will choose one of the following forms of examination:

- (c) Course work (35%)

or

- (d) Paper 3 of 2 hours (35%) preceded by ten minutes reading time,

or

- (e) Paper 3 of 2 hours (20%), preceded by ten minutes reading time, combined with Course Work (15%).

PAPER 1

This will be based on the common-core syllabus. Questions will be of the multi-facet type (open, multi-choice or true/false) or multi-choice (non multi-facet)—one or more of these variants will be adopted. It will be planned to take 1½ hours to answer but candidates will be allowed up to 1¾ hours.

PAPER 2

This will be based on the common-core syllabus. It will be planned to take 1½ hours to answer but candidates will be allowed up to 2 hours.

Mathematics

COURSE WORK

This will take the form of internal assessment of work beyond the common-core, externally moderated. The Board recognises the vital importance of supporting existing interesting and valuable developments and of encouraging further experiments. It therefore wishes schools or groups of schools to have the greatest possible freedom both in the system of assessment they choose and in the range of work which they cover. This work may include topics mentioned above and/or different extensions of the common-core; it may include project work, practical work of various sorts, etc.

PAPER 3

This will consist of a section on each of the following topics: "Modern Mathematics"; "Choice, Chance and Statistics"; "Social Mathematics"; "Algebra, Trigonometry and Elementary Calculus"; "Development of Mathematics"; "Surveying"; "The Earth and Sky"; "Physical Measurement and Elementary Mechanics". Candidates will be able either to concentrate on one topic or to answer questions on several. All sections will have the same number of questions. The paper will be planned to take $1\frac{1}{2}$ hours to answer but candidates will be allowed up to 2 hours. During the ten minutes allowed for reading before the start of the examination supervisors may direct candidates' attention to *sections* (not questions) which are likely to be inappropriate.

PAPER 3 COMBINED WITH COURSE WORK

The total marks for Paper 3 will be scaled down to 20% and the remaining 15% will be awarded to Course Work, internally assessed and externally moderated. The Course Work must be within the range of one or more of the topics named above.

NOTES

1. *A pamphlet will be provided for the use of candidates in the examination. It will include all relevant formulae and, possibly, other reference material. Candidates should be able to use logarithmic, square and square root, reciprocal and trigonometrical tables: slide rules may be used in the examination. Space for rough work will be provided.*
2. *The Board hopes to allow the use of general reference material in at least one of its Mathematics papers by 1967. In the meantime it is continuing its enquiries into the practical problems involved in this and will welcome views in writing, particularly from teachers who have conducted experiments which allow candidates to use reference books, etc., in mathematics examinations.*

SYLLABUS

It is assumed that the general approach to the syllabus will be intuitive, inductive and practical, utilising to the full opportunities for children's discoveries through experience and experiment. Deductive arguments should be encouraged where appropriate but there will be no need to reproduce formal proofs of theorems in the examination.

Candidates should have some knowledge of the historical development of Mathematics.

Knowledge of mathematical symbols should include $>$, $<$, \equiv , \neq and \simeq .

COMMON CORE

NUMBER, LANGUAGE AND RELATIONSHIPS

Notational representation of natural numbers with particular emphasis on denary and binary scales: awareness of other scales and modes of representation will be expected. The concept of place value: decimal representation.

Units of measurement of money, weight, length, capacity and time: the metric system.

The principle of conversion with application to conversion between binary and denary scales and from one unit of measurement to another, including decimalisation of compound quantities.

Some properties of natural numbers.

Extension of the natural number system to rational numbers, directed numbers and irrational numbers. Common fractions: equivalence of fractions: fraction as a ratio of two numbers. The concept of a percentage. Interchange between fractions, decimals and percentages. The understanding of ratio and of the relationships of direct and inverse proportion. The understanding of rate—in particular, speed and acceleration. The idea of an average. Convenience of index notation: representation of large and small numbers using powers of ten, including negative indices: a logarithm as an index. Simple illustrations of index laws. The importance of estimation and of information given by approximations: the use of significant figures, decimal places, limits of accuracy, e.g. $3.2'' \pm .01''$ and index notation.

EXPLANATORY NOTES

e.g. representation by Roman symbols.

British units providing examples of systems with mixed bases: metric system one with a denary base.

Odd numbers, even numbers, primes, factors and multiples, square and triangular numbers, etc., patterns in number tables (5, 9, etc.), pattern in number series, tests of divisibility.

Understanding and use of the normal computational procedures, including simple calculations with logarithms and the use of short methods of calculation. The application of concepts and computation to simple situations.

The representation of mathematical patterns and relationships in general terms using symbolic expression: the development and simple use of formulae. Operations with letters as generalised forms of the same processes with numbers: the use of brackets.

The formation and use of simple equations with applications.

The representation of statistical data on various types of graph: the interpretation of such graphs: interpolation and extrapolation.

The meaning of coordinates. The algebraic and graphical representation of the important functional relationships with their numerous applications to everyday phenomena.

The formation and solution of easy equations of higher degree and of simultaneous equations.

The difference between an identity and an equation. Relationships expressed as inequalities, including graphical representation.

References to past computational procedures are recommended as a historical topic.

Questions will be so framed that they are easily understood, are as realistic as possible and do not require specialist knowledge. It will be assumed that candidates can read timetables, ready reckoners and similar documents, and are familiar with the main concepts of everyday money matters, e.g., topics such as personal and family budgets.

These would include direct and inverse proportion, linear, quadratic and cubic laws, the emphasis being placed on recognition and interpretation.

The emphasis here is on the principles of solution, including the possibility of graphical solution, and not on techniques. The general solution of the quadratic equation will not be required, but candidates must be prepared to deal with very simple cases of solution by factors.

Knowledge of the simpler algebraic identities (e.g. "difference of two squares") with geometrical equivalents and arithmetical illustration.

SHAPE AND SIZE

Knowledge of the common geometrical vocabulary is assumed and in the discovery and establishment of geometrical truths it is hoped that candidates will have had experience of at least some of the following: paper-folding, geo-boards, curve-stitching, models (including those showing movement) and other media. In constructional work a liberal use of suitable instruments is to be encouraged: the ability to use ruler, compasses and protractor may be tested.

A clear concept of the meaning of area and volume: units for these.

An appreciation of symmetry.

Angles: as amount of turning and angles at a point. Properties of angles in association with parallels and transversals. Measurement and construction of angles.

Similarity: similar shapes in two and three dimensions. Relationships of length, area and volume in similar figures, with applications. Scale drawing with application to finding heights, etc. Congruence as a special case of similarity.

Knowledge of loci in two and three dimensions, including ability to draw simple two-dimensional loci. Appreciation of envelopes.

Simple properties of polygons, including sum and size of angles: construction of regular polygons and use in making patterns.

The triangle: inequalities: construction of all types of triangles: angle properties and simple calculations thereon: Pythagoras' Theorem in arithmetical applications: rigidity of triangular structures: area. Similar right-angled triangles and the constant ratios of sine, cosine and tangent: use of these in practical work and in the solution of simple problems in two and three dimensions.

An understanding of both plane and curved surface areas is expected.

Including application to bearings.

Discovery of the sum of exterior angles: sum of interior angles by simple deduction from this or by induction.

Candidates should be aware that the sum of any two sides is greater than the third and that the greatest angle is opposite the greatest side, etc.



Simple properties of the quadrilateral and its various special cases.

The circle: relationships between radius and diameter, radius and circumference and radius and area: arcs: tangents: chords: sectors and angle properties. The annulus.

Recognition of common and regular solids: their nets where appropriate. Volume of common solids. Surface areas of developable solids.

These will include area properties.

It is expected that candidates will be aware of the intuitive ratio property of arc, angle at centre and area of sector.

TOPICS

Knowledge of the common core will be assumed throughout.

"MODERN" MATHEMATICS

Set notation and language: operations of union and intersection: use of Venn diagrams.

Basic operations and laws of algebra (i.e. commutative law, associative law, distributive law): identity and inverse elements: inverse operations.

Simple relations: reflexive, symmetric and transitive properties. Extension of the idea of symmetry: further development of inequalities leading to linear programming.

Flow charts.

Elementary vector algebra (including use of number line, directed numbers, etc.). Addition, subtraction, multiplication by a scalar. Components.

Note. As this section deals with comparatively unfamiliar material a pamphlet giving greater detail is being prepared and will be available from the Board in July, 1965.

CHOICE, CHANCE AND STATISTICS

Collection, tabulation and graphical portrayal of data: interpretation thereof.

Frequency distribution, including cumulative frequency.

Simple examples of permutations and combinations ("order of merit" competitions, etc.).

Probability: a common-sense interpretation backed up by experimental evidence (dice: coin-tossing, etc.): Pascal's triangle and very simple cases of the binomial distribution.

Averages, including short methods of calculating the arithmetic mean (assumed mean: use of grouped data).

Measures of dispersion.

The normal distribution: some acquaintance with its shape and simplest properties.

The idea of correlation: graphical representation by scatter diagrams.

Ideas of sampling and significance (no depth can be expected here — only some appreciation of the importance of the concepts).

The mis-use of graphs and statistics.

It is assumed that the work will be largely based on experience and experiment: evidence of experimental work may be demanded in the examination.

Note. As this section deals with comparatively unfamiliar material a pamphlet giving greater detail is being prepared and will be available from the Board in July, 1965.



ALGEBRA, TRIGONOMETRY AND ELEMENTARY CALCULUS

Consolidation of the normal processes of algebra including the solution of quadratic equations and more detailed treatment of variation.

Determination of linear law from experimental data.

Exponential law of growth.

Further applications of algebra to the solution of problems.

Gradients of graphs and the differential coefficient: the integral as an inverse function: definite integration.

Applications of these will include simple kinematics, maxima and minima and areas under curves.

Radian measure.

Sine and cosine rules: understanding and simple use (questions involving extensive calculations will not be set).

MATHEMATICS IN SOCIETY

1. ARITHMETIC OF THE HOME

Renting or buying: mortgages: deposits and repayment: saving for your home. Rateable value: paying the rates. Paying and calculation of household bills. Planning, layout and costing of a new house and its surrounds. Scale drawing.

2. AT WORK

Wages, salaries, commission, bonus. Deductions, P.A.Y.E., National Insurance, superannuation, Income Tax.

3. PROVIDING FOR THE FUTURE

Insurance and assurance: fire insurance, comprehensive insurance, life assurance policy, house purchase by an endowment assurance, motor car insurance.

EXPLANATORY NOTES

It is assumed that, under this section, matters not specifically listed will be touched upon, e.g. what is involved in buying and building a house; land purchase, inspection fees, legal charges, repayments; local government budgeting and services; reading meters; comparative costs of oil, coal, gas and electricity. The value of saving and investment.

Candidates should be familiar with wage and time sheets, overtime, piece work, etc. The general structure of income tax should be known but details need not be memorised: i.e. Earned Income Allowance, Personal Allowance, Children's Allowance, Dependent Relative's Allowance, Life Insurance Allowance. This applies also to National Insurance under the section on deductions.

Under this section should be stressed the wise policy of insuring property against fire, theft, storm and flood and the special features of endowment assurance.

4. CREDIT AND INSTALMENT SYSTEMS

Hire-purchase: deferred terms: hire or rental of domestic appliances.

No work on credit or instalment systems is complete if it fails to compare their advantages and disadvantages with those of payment in cash. Reading and understanding of rental and hire-purchase contracts.

5. BANKS AND BANKING

Banks in general: the Post Office as a bank. Savings Certificates and Premium Bonds.

Candidates should be familiar with the use and value of ordinary bank accounts.

6. GOVERNMENT AFFAIRS: THE POST OFFICE

The budget: direct and indirect taxation, including purchase tax. Postage rates, including telegrams: postal and money orders: licences; pensions and allowances: National Insurance stamps.

7. HOLIDAYS

Distances: travelling times: speeds: land, sea and air travel fares and other expenses. Foreign currency and exchange.

Use of table of currency rates. Conversion graphs.

DEVELOPMENT OF MATHEMATICS

Evolution of systems of notation, weights and measures, coinage and the measurement of time.

Including decimal coinage and stages in the development of the calendar.

The development of methods of calculation: (a) with symbols, (b) with "aids".

"Aids" include, *inter alia*, abacus, counting frame, Napier's rods, slide rule and modern calculating machines.

The contributions of various races and civilisations including the life and discoveries of a number of the following: Thales: Pythagoras: Euclid: Eratosthenes: Archimedes: Fibonacci: Napier: Descartes: Pascal: Newton: Leibnitz: Euler: Gauss.

This list of names is not exclusive: others will naturally occur in various contexts.

Candidates must be prepared to answer questions and to work out problems involving discoveries and contributions to the development of mathematics.

SURVEYING

Description and elementary use of instruments (chains, tapes, clinometer, theodolite, plane table, prismatic compass, Dumpy level, levelling staff, etc.).

General principles in fixing points.

Use of drawing in measurement of heights and distances.

The purpose of maps and plans: map scales, conventional signs, contours: copying, enlarging and reducing plans.

Chaining on level and sloping ground: chaining round obstacles.

Use of field book. Layout of chain surveys. Check measurements. The use of offsets and tie lines. Plotting simple plans from field book. Calculation of areas of plans (by triangles and offsets and by the use of the mid-ordinate rule and Simpson's rule).

Simple traverse surveys using a prismatic compass.

Terms used in levelling: simple section levelling. Methods of booking level readings and checks. Plotting to scale from level book.

Contouring — grid method.

It is assumed that this section will be treated in a practical way and evidence of practical experience may be demanded in the examination. Where appropriate, links with elementary trigonometry should be emphasised.

While it might be very desirable for schools undertaking this work to be equipped with the instruments listed in paragraph 1, it is recognised that, in many cases, expense will make this impracticable. The objective is that pupils should understand the nature and use of these instruments and this may well be achieved through improvised and simplified instruments which can illustrate the principles involved although their accuracy may be limited.

THE EARTH AND THE SKY

Geometry of the sphere. Great and small circles: latitude and longitude: distances on parallels and meridians: the 24-hour clock and world time, fixing of position of heavenly bodies by right ascension and declination. Simple consequences of the inclination of the earth's axis and of its rotational and orbital motions day and night: seasons: the ecliptic.

The problem of map making and elementary knowledge of the various standard projections: Mercator, Simple Conical, Circumpolar maps. Great circle and rhumb lines.

Elementary ideas of sea navigation: properties and uses of Mercator and Gnomonic charts, the magnetic compass, variation and deviation, the standard nautical mile, the cable and knot: conversion of course and bearings: chart plotting, position finding by cross bearings. The sextant and finding latitude from the sun's meridian altitude.

Descriptive astronomy: solar system, constellations, stars and galaxies. Size and distance, light year and astronomical unit.

PHYSICAL MEASUREMENT AND ELEMENTARY MECHANICS

Concepts of distance, time, mass and force.

Derived concepts of displacement, density, specific gravity, speed, velocity and acceleration.

Simple kinematics, including vertical motion under gravity.

Units of measurement and measuring instruments (vernier, micrometer, etc.).

EXPLANATORY NOTES

Displacement will involve direction and sign.

Units will include F.P.S. and C.G.S. systems and the distinction between absolute and gravitational units, leading to the concept of weight.

Mathematics

The concept of a vector: composition of vectors with application to velocities, accelerations, forces, etc.: resultants and components.

Equilibrium of forces: The turning effect of a force—principle of moments—levers.

Simple work on centres of gravity.

Forces producing acceleration in a straight line. Newton's Law " $P = mf$ ".

Concept of work. Simple machines: the terms Velocity Ratio: Mechanical Advantage: Efficiency.

The word "vector" is used as the correct unifying expression covering traditional work: no involved theoretical work on vectors is expected.

Solutions by drawing to questions on resultants and components will be acceptable.

Coefficient of friction is excluded.

Only very simple applications of Newton's Law will be expected.

Machines to include various pulley systems, wheel and axle, gears including worm and worm wheels, screws.

Where possible practical investigation is recommended. Graphical treatment is stressed, e.g. in displacement/time and velocity/time graphs and in work with machines; candidates should understand the significance of intercepts, gradients and areas where relevant.

METALWORK

GENERAL

It is recommended that the course should have an aesthetic rather than a vocational bias. A minimum of 80 hours per year or 240 hours over a three year course is desirable to achieve the standard expected. Experience in the craft presented for the examination should be continuous over the last two years.

FORM OF EXAMINATION

The examination will comprise:

- (a) Theory paper of 2 hours preceded by 10 minutes for reading (30%).
- (b) Practical test of 2 hours preceded by 10 minutes for interpreting the drawing (15%).
- (c) Course work
 - (i) Individual piece of work (45%).
 - (ii) Project study (10%).

THEORY PAPER

This will consist of TWO sections:

Section A will contain 20 compulsory questions requiring short answers.

Section B will contain 16 questions from which candidates must answer four. The questions will be of a general nature. Opportunity will be given to specialise in beaten metalwork, jewellery, enamelling and metal sculpture.

PRACTICAL TEST

This will be a bench exercise in which simple design will be left to the candidate.

The candidate's ability to read a simple drawing will be tested. The use of the lathe will not be required.

COURSE WORK

This will consist of TWO parts:

- (a) An individual piece of work made in the candidate's last year at school chosen after consultation with his teacher. The following suggestions are made:
 - (i) a set of fire-irons;
 - (ii) a group of hand tools, e.g. adjustable spanner, odd-leg calipers, hack-saw and tap wrench;
 - (iii) a working model, e.g. a steam engine;
 - (iv) a school trophy.
- (b) A project study covering materials, processes and historical aspects of metalwork. Sketches and/or drawings should form an integral part of the study. A bibliography of books consulted should be included.

SYLLABUS

The Theory paper will contain questions based on the following topics:

1. SHEET METALWORK

Simple development of rectangular and cylindrical shapes (development of the cone to be excluded). Simple methods of jointing and edging.

Metalwork

2. BEATEN METALWORK

Development of curved surfaces, simple hollowing, raising, surface decoration. Use of graded solders.

3. FORGE WORK

General developing processes: bending, twisting, drawing down, use of the scroll iron.

4. HEAT TREATMENT

Case hardening, hardening and tempering, normalizing, annealing.

5. BENCH WORK

Marking out and measuring. Cutting, shaping and bending with normal bench tools. Use of hand and power drill. Drills and hand reamers, riveting. Use of taps and dies. Brazing.

6. LATHE WORK

Elementary chuck, centre and face plate work. Drilling and boring. Simple taper turning. Knurling and hand turning.

7. FOUNDRY WORK

Simple sand moulding and casting in non-ferrous metals.

8. WELDING

Simple fabrication using electric arc or gas equipment.

9. JEWELLERY AND ENAMELLING

Simple forms of jewellery and use of enamels. Use of small kiln.

10. METAL SCULPTURE

Free expression in all metals.

11. FINISHES ON METALS

Oil finishes and plastic coatings, etc.

12. MODEL ENGINEERING

The engineering principles of the construction of simple engines and turbines.

13. SAFETY PRECAUTIONS

Care and use of hand tools and machine tools. Precautions in the use of acid baths, heating, and electrical equipment.

14. PROCESSES AND PROPERTIES OF METALS

MUSIC

GENERAL

Music by its nature presents a number of problems as an examination subject. As an art concerned with the creation and presentation of sound in an ordered way it demands practical and live expression. This involves performance and a certain measure of practical ability, as well as corporate activity. Music takes place in time. This presents difficulties, as songs and pieces studied, and perhaps performed, over a period of time, cannot be kept in the repertoire at concert standard as new works have to be learnt. Even today it is not always desirable or practical to record pieces learnt by candidates, for presentation at an examination.

The Subject Panel discussed these and other problems, together with their aims and objectives for a course of study leading to an examination. They decided that the most important and valuable aspects of music should be examined as it is these that should be encouraged. Practical performance therefore finds a place in the examination, as does musical literacy, the ability to translate symbol into sound and vice versa, and the attempt to examine musical response through listening. It was also felt that a candidate should be able to pursue some individual interest and that over a period of five years he should have attained a general knowledge of the background to music.

The Board hopes that the examination will act as a stimulant to all kinds of practical music and that candidates will be able to find pleasure in their own music making.

FORM OF EXAMINATION

The examination will consist of FOUR main sections. Candidates will be expected to give evidence of:

- (a) practical ability,
- (b) the pursuit of some individual musical interest in the form of a project,
- (c) musical literacy — the ability both to listen to music with some degree of analytical understanding and to read it,
- (d) general musical knowledge.

SYLLABUS

SECTION I

PRACTICAL ABILITY (30%) TO BE MARKED INTERNALLY

Candidates should be able to show some practical ability and to make reasonable progress in a number of pieces or songs over a period of time preparatory to the examination.

They should be able to sing or play either a solo and/or take part in an ensemble piece. In the latter case there should be one singer or player to each part.

No matter how simple the pieces chosen may be, candidates should be encouraged to give a high standard performance and present music of good quality.

Music

SECTION II

PROJECT OR "FIELD STUDY" (15%). To be marked internally.

Candidates may submit a subject of their own choice. The following are merely suggestions:

- An original composition or arrangement, e.g. a folk song arranged for S.A.B. or melody with guitar accompaniment.
- An essay on some musical topic.
- A study of some commercial or administrative aspect of music.
- The making and playing of simple instruments.
- The presentation (suitably annotated) by the candidate of a balanced concert programme; the chosen items may be live or recorded.

SECTION III

MUSICAL LITERACY

1. LISTENING (20%).

Candidates will be expected to insert on a score as much detail as possible of a short piece of music in four phrases played on a disc as many times as there are questions. The candidate will have the melody line of three of the phrases written out for him. He should attempt to complete the melody and rhythm of the phrase omitted and also insert the following details on the score:

- the key signature (the key having been named),
 - the time signature,
 - the phrase marks, the form of the piece, e.g. A.A.B.A., and a sequence,
 - suitable marks of expression, e.g. *crescendo*, *ritardando*, etc.,
 - the key to which the music modulates at a specified place (dominant or relative minor, or if in a minor key the dominant or relative major) and the bar where a second key change takes place,
 - the cadences at a given point (perfect, plagal, imperfect, interrupted).
2. READING (10%). To be marked internally.

There will be set tests for all candidates.

The best of three attempts will be marked and the candidate will be given up to five minutes for preparing the test.

Marks will be given for musical performance as well as accuracy.

EITHER

- Sight singing. Candidates will be expected to sing, hum, or whistle an eight bar phrase in a major key, with not more than two sharps or two flats. The range of the notes will not exceed an octave and some harmonic support will be given to aid the candidate. Teachers may transpose the accompaniment if necessary. The first 4-bar phrase will be easier than the second.

Time signatures and rhythmic patterns will be limited to the following:

Simple time: $\frac{2}{4}$ $\frac{3}{4}$ $\frac{4}{4}$ 

Compound time: $\frac{6}{8}$ 

Music

- OR (b) Sight playing. There will be suitable tests for different instruments. Requirements are the same for the sight singing tests but the range of notes will not be limited to an octave and instrumental players should be conversant with



SECTION IV

MUSICAL KNOWLEDGE (25%) to be tested by asking 25 simple questions about short extracts or pieces of music played on a disc.

Candidates should have a general knowledge of:

- (a) the history of music from 1550 to the present day and the four main styles of music — polyphonic, classical, romantic, modern;
 - (b) instruments: their sound and range;
 - (c) voices: their sound and range;
 - (d) forms: such as concerto, oratorio, opera, symphony, incidental music, ballet and chamber music.
-

NEEDLEWORK

GENERAL

The syllabus is devised to assess whether for her age a 16 year old girl has acquired:

- (a) a reasonable appreciation of design, colour and texture in relation to dress and household furnishing;
- (b) sufficient knowledge of fabrics and constructional processes to be of value, in the choice, judgement of quality, maintenance and alteration of clothing (including ready-made garments) and household articles;
- (c) the fundamental techniques of at least one branch of needlecraft to a degree which will enable her to find it of value in home-making, enjoyable as a hobby or as a preliminary to a career, e.g. in the case of dressmaking that she is capable of independent work from simple patterns.

NOTE:—*The syllabus has been left flexible to afford individual teachers opportunity to experiment within the basic framework.*

FORM OF EXAMINATION

The examination will comprise:

- (a) Course Work (30%).
- (b) Practical Test of 4 hours (40%).
- (c) Theory Paper of 2 hours (30%).

COURSE WORK

The candidate will be required to make a garment of her own choice to fit herself and to include a suitable variety of processes. She will also be required to make one item chosen from Part II of the syllabus (Additional Studies) and to submit a folder of information relative to the chosen Additional Study.

PRACTICAL TEST

The candidate will be required to cut and construct part of a garment from a pattern supplied by the Board.

The test will be taken over two sessions:

- (a) Preparation (45 minutes). The pattern will be laid and the work will be assessed by the teacher who may subsequently rectify any errors before the remainder of the work proceeds.
- (b) Continuation (3½ hours). Cutting and sewing. This will take place on the day following the Preparation.

THEORY PAPER

This paper will be set on Part I of the syllabus, and will be divided into two sections.

Section A will contain ten compulsory questions requiring short answers, and will be allocated 25% of the marks for the Theory paper.

Section B will contain a number of questions requiring more detailed answers.

Needlework

SYLLABUS

PART I (THEORY)

1. Elementary study of fabrics and simple weaves. Origin and properties of natural and man-made fibres.
2. Choice, use and maintenance of tools and equipment.
3. Study of texture, colour and design in relation to function.
4. Fashion and good grooming; wardrobe planning and budgeting — wise shopping.
5. Stitchery and processes used in the making and decoration of garments and household articles.

PART II (ADDITIONAL STUDIES)

The following studies are intended as suggestions, and candidates' choice will not be confined to them.

1. EMBROIDERY. Hand or machine — related to clothing or household articles — original or adapted design.
 2. CLOTHING. Planning a personal wardrobe. Outfits for different occasions. Wise shopping — assessment of quality of fabrics and workmanship. Personal hygiene and good grooming. Maintenance and repairs.
 3. CLOTHING FOR BABIES AND CHILDREN UP TO SCHOOL AGE. Planning layette or outfit for a small child — cost; styles; outdoor and indoor clothing (including knitted garments if desired); safety protection, hygiene, maintenance and laundering. Soft toys.
 4. HOUSEHOLD FURNISHINGS. Study of colour scheme and interior decoration. Choice of room: the living room; the sitting room; the bed-sitting room for the teenager; the dining room; the bedroom. Cost of furnishing schemes. Making and measuring for curtains, cushions, bed covers, table linen.
 5. CRAFTS ALLIED TO NEEDLEWORK (INCLUDING ACCESSORIES).
-

PHYSICS

GENERAL

The syllabus may appear orthodox in its presentation of areas of work to be studied. The teacher is of course free to determine the order in which children study the topics. It is assumed that whenever possible an experimental approach to study will be followed.

To give the syllabus breadth and depth it has been divided into two parts. The basic syllabus covers those sections of the subject which should be attempted by all candidates. The optional topics give an opportunity for the development of any particular bias or interest and will enable certain selected aspects to be studied to a greater depth. The list of these topics is provisional and will be amended and extended as the necessity arises.

FORM OF EXAMINATION

The examination will comprise:

- (a) Two written papers each of $1\frac{1}{2}$ hours.
- (b) Practical test.
- (c) Course work.

PAPER I (45%)

The paper will contain compulsory short answer questions on the basic syllabus.

PAPER II (30%)

The paper will contain questions on the optional topics. Any question may refer to the relevant sections of the basic syllabus. **Candidates will be expected to answer not more than one question from each of three sections.** They will be free to choose questions on topics other than those studied in school. The time of $1\frac{1}{2}$ hours will be sufficient for the average candidate to study the questions and revise his answers.

PRACTICAL TESTS (15%)

This will be devised to test the ability of candidates (a) to use simple measuring instruments, (b) to observe and record accurately, (c) to draw conclusions from observations and recordings. The candidates will do a number of short experiments and the examination will be marked by the teacher.

COURSE WORK (10%)

This will be assessed by the teacher, the assessment being of the pupil's oral, written and practical work and not of his expected examination result.

BASIC SYLLABUS

Simple mathematical questions will be set only on those parts which are in *italics*.

HEAT

The simple kinetic theory of matter should be used, wherever possible, to explain the effects of heat, including the concept of the absolute zero of temperature.

Heat as a form of energy; the production of heat as an energy conversion; the idea of mechanical equivalent of heat. °C and °F temperature scales, but no conversion of one to the other. Thermometers. Use of liquid-in-glass, maximum, minimum, clinical, bi-metallic and thermo-couple thermometers.

Physics

Qualitative aspects of the expansion of solids, liquids and gases with everyday applications; the special case of water. Evaporation and boiling; freezing and melting; the refrigerator, cooling by evaporation, the idea of latent heat. Influence of pressure and dissolved substances on melting and boiling points; determination of melting points by cooling curves. Transfer of heat by conduction, convection and radiation; heat insulation; everyday application of these. Thermal capacity leading to the units of heat; calorific values of fuels and foods; the idea of specific heat.

Calculations will be limited to the heat involved in the change of temperature of water, the change of state of water and calorific values.

SOUND

Vibrations as the source of sound. A qualitative treatment of vibrating strings and air columns as sound sources. The nature of a sound wave in air. Loudness and amplitude; pitch and frequency; resonance; quality of sound as the mixture of frequencies. Need for a medium for transmission. *Simple determination of the velocity of sound in free air.* Simple treatment of sound proofing and avoidance of echoes in rooms. *Simple calculations on echoes.*

LIGHT

Light as a form of energy; the electromagnetic spectrum. Straight line propagation; shadows and eclipses; the pin-hole camera. Factors affecting the passage of a light beam at the boundary between two media (reflection, refraction, transmission, absorption). Reflection at single plane and curved surfaces; *ray diagrams for plane and spherical surfaces to determine the position and nature of the images.* (No calculations based on the mirror formula, the mirror to be taken as a straight line through the pole and perpendicular to the axis.) Refraction at plane surfaces; the direction and relative bending at the boundary between common substances; real and apparent depth. Total internal reflection; the idea of critical angle; refraction through equiangular and right angled triangular prisms. Thin spherical lenses; *ray diagrams to determine the position and nature of the image.* (No calculations based on lens formula; the lens to be taken as a straight line through the optic centre perpendicular to the axis.) Colour. Dispersion, production of an impure visible spectrum; colours of objects seen in white light, artificial light and filtered light; mixing of coloured lights and pigments; colour triangle. The eye as an optical instrument compared with the camera; accommodation of the eye lens; correction of long and short sight; the dioptre as the unit of power; persistence of vision. It is expected that the study of reflection and refraction will be done by reference to such items as shaving and driving mirrors, periscopes, the magnifying glass and inverting and reflecting prisms.

ELECTRICITY AND MAGNETISM

Production of electricity as an energy conversion as shown by mechanical (frictional and magnetic), chemical, heat and light sources. Simple electric circuit; conventional current and electron flow; conductors and insulators. Practical units; ampere, ohm and volt; use of ammeters and voltmeters; *Ohm's Law*; resistance of wires; *series and parallel arrangements of resistors and cells.* (Calculations will not involve the internal resistance of cells.) *The power equation (watts = amps \times volts);* examples of heating effects of electric current; electric fires and electric lamps; action of a fuse; *correct fuses for domestic appliances; the kilowatt-hour; cost of electricity.* Simple qualitative treatment of electro-plating. The structure and use of the dry cell and lead accumulator. The magnetic effect of an electric current flowing in a straight wire and in a solenoid. Electromagnets. The buzzer; simple relay; door chimes. Moving coil and moving iron meters. Principle of D.C.

Physics

motor and A.C. and D.C. generator. Induction coil. Transformer. Metal rectifier as used in battery charger. Permanent and temporary magnets; the law of repulsion. The earth as a magnet; magnetic variation.

MECHANICS AND PROPERTIES OF MATTER

The difference between mass and weight. *Force, work, energy and power*; conservation of energy. Centre of gravity and stability. *Levers; single pulley and block and tackle; gears and simple gear ratios; the screw. The efficiency of a machine and the loss of energy by friction.* (The classes of levers need not be known.) *Density.* Principle of buoyancy. Comparison of densities by hydrometer. Atmospheric pressure, simple barometers. Practical applications connected with pressure such as the simple bicycle pump; exhaust pump, bathyscaphe; pressure suits. The hydraulic braking system of a car, the hydraulic press and the knowledge of the transmission of pressure by liquids. The simple distinction between longitudinal and transverse waves; the formula $v = n\lambda$.

OPTIONAL TOPICS

In these sections mathematical questions will be set where appropriate.

SECTION A PHOTOGRAPHY

1. The camera. Types of camera including the reflex. Lens and shutter arrangements. Care of camera.
2. Use of the light meter.
3. The idea of depth of field.
4. Combination of shutter speed and aperture. Fast moving oblique objects. Views; portraits; choice of speed and aperture dependent on type of film as well as subject.
5. Film speeds and types. The idea of film speed. A.S.A., Weston and DIN, but no conversion. Grain of films. Emulsion. Pan film. Colour films. Choice of film for specific task.
6. Picture composition. Through the viewfinder and in the print. Awareness of common faults, (e.g. subject too far or too near, distortion of subject, feet, background objects growing from head).
7. Development. Simple chemistry of development, (not colour). Types of developer. Time and temperature. Stale developer. Fixing and clearing. Drying care.
8. Negative faults. Over and under exposure and development. Reduction and intensification. Spotting. Effect of light entering camera.
9. Printing; contact technique; enlargement; composition of picture; masking; correcting verticals; developing, fixing and drying; glazing.
10. Mounting of finished print.

Candidates should also have tried the effects of contre-sol, filters and artificial lighting.

They would also be expected to give a criticism of faulty prints.

SECTION B METEOROLOGY

1. THE PHYSICAL CHANGES THAT OCCUR IN THE ATMOSPHERE

Temperature — isotherms — changes due to ascent and descent. Water vapour in the atmosphere — mist, hoar frost, dew, cloud, fog. Barometric pressure — isobars. Winds — the Beaufort scale. Vertical movement of the atmosphere. Cloud formation — types of cloud. Pressure systems. Air masses — types of air mass. The structure of a depression — fronts — movement of depressions and fronts.

2. WEATHER FORECASTING

- (a) The measurement of weather conditions at different places.
- (b) The putting together of reports to make a weather map.
- (c) Using weather maps to make a forecast.

3. METEOROLOGICAL INSTRUMENTS

Barometer and barograph, thermometers, psychrometer, hygrograph, wind vane, anemometer and anemograph, sunshine recorder, rain gauge and rainfall recorder, cloud searchlight, ceiling balloon, visibility meter.

SECTION C ENGINES

1. Engines as examples of the conversion of energy.

2. Steam engines and internal combustion engines — general comparison of similarities and differences.

3. STEAM ENGINES AND TURBINES

The slide-valve steam engine — outline of working principles. Its application in the railway locomotive (but not details of this). The steam turbine — principle of operation. The uses of steam turbines — ships, electricity generation.

4. INTERNAL COMBUSTION ENGINES

- (a) The petrol engine (four stroke), the diesel (compression/ignition) engine, the gas turbine engine. The cycle of induction, compression, power and exhaust as seen in these engines. The two-stroke petrol engine.
- (b) The two auxiliary services of carburation and ignition as applied to the petrol engine — the purpose of the carburettor — the air/petrol vapour mixture — the need for air and the importance of atmospheric pressure, (apart from basic venturi principle of the simple carburettor, no detailed knowledge will be required of the operating principles of the carburettor). The outline of the ignition system (no details of induction coil).
- (c) Lubrication — general principles. The cooling system — air cooled and water cooled types.

SECTION D

GENERATION, DISTRIBUTION AND DOMESTIC USE OF ELECTRICITY

1. Generation — outline of the processes involved at coal-fired, oil-fired, hydro-electric and nuclear power stations.

2. Transmission and distribution — the grid transmission mains, sub-stations, distribution in town and village.

Optional Topics (Physics)

3. Circuits in the home — lighting, cooking, water heating, central heating and ring circuits. Main switches, meter, fuse board. Purpose and renewal of fuses. Lighting and power points. Two-way switch.
4. Reading the meter.
5. Flex, plugs and sockets — use of two-core and three-core flex. Earthing and use of three-pin plugs, including fused plugs. Correct installation of heaters in bathrooms and kitchens.
6. Controls — thermostat, three-heat switch, variable and thermostatic controls of boiling plates, automatic time controls.
7. Appliances — simple knowledge of construction and working, also running cost of:
 - (a) tungsten and fluorescent lamps,
 - (b) radiant and infra-red fires, convectors, oil-filled radiators, panel heaters, fan heaters, carpet underlays, "off-peak" heating,
 - (c) water heaters for sink and bath,
 - (d) cookers,
 - (e) refrigerators (absorption and compressor),
 - (f) washing machines and boilers; dryers,
 - (g) blankets, kettles, toasters, irons, etc.,
 - (h) vacuum cleaners, food mixers, hair dryers, sewing machines.

SECTION E FORCE AND MOTION

This option is specifically intended for the more mathematically inclined pupil and will be treated mathematically.

1. LINEAR MOTION

Uniform acceleration. The equations of uniformly accelerated motion. The idea of momentum. Resolution of velocities, and forces, into rectangular components.

2. CIRCULAR MOTION

Angular velocity. The acceleration and force towards the centre of a circle for an object moving with uniform angular velocity round the circle.

3. MOTION OF FALLING BODIES

Motion under gravity. Determination of the acceleration due to gravity.

4. NEWTON'S LAWS OF MOTION

The first law: Illustrations of inertia — the meaning of force.

The second law: Force, mass and acceleration; the poundal and dyne. The relationship between absolute and gravitational units of force.

The third law: Conservation of linear momentum.

5. MOTION OF A PROJECTILE

The motion of a projectile that is fired horizontally, and of one that is not fired horizontally. The variation of range with angle of projection.

The application of the principle of conservation of momentum to rocket propulsion and jet engines.

Optional Topics (Physics)

SECTION F TELECOMMUNICATIONS

1. TELEGRAPHY

Simple line circuit involving two key-send/receive stations (buzzer or lamp).

2. TELEPHONY

The telephone receiver (headphones, loudspeakers, permanent magnet). (Simple sound powered circuit). The telephone transmitter or carbon microphone. Simple circuit between two stations involving receiver, microphone, battery and induction coil (transformer). The uniselector.

3. RADIO

Sufficient atomic theory to explain action of: Thermionic diode and triode. Curve of anode voltage related to grid voltage. Use of triode in an amplifier circuit and application to record player/tape recorder/amplifier. Use of crystal pick-up and photocell. Use of magnetic tape. Action and choice of moving coil, crystal and ribbon microphones. Simple coupling to amplifier circuit, transformer and capacity. Parallel oscillatory circuit. Modulation and transmission. Tuning. Detection by crystal diode and simple receiver. Simple coupling and amplification. Use of transistor in place of triode.

4. TELEVISION/RADAR

The cathode ray tube as a development of triode. Persistence of vision. Magnetic or static focussing. Simple time base circuit operation. Use of cathode ray tube in oscilloscope. Use of cathode ray tube in radar (range determination only). Use of cathode ray tube in television with reasons for number of lines per frame. Idea of brightness modulation depending on signal received. Received signal dictates type of aerial. The dipole and simple idea of action of domestic reflector/director array.

SECTION G NUCLEAR ENERGY

1. ATOMS AND MOLECULES

Evidence for the particulate nature of matter, such as dilution and Brownian motion; evidence for the large number of molecules per c.c.; the size of the atom.

2. THE ELECTRON

Evidence from electrolysis for the particulate nature of electricity, and the idea that a certain amount of electricity is associated with a given atom. Discharge through a gas leading to cathode rays; the idea that the electron is a universal particle.

3. X-RAYS

The production of X-rays; the nature of X-rays and their relative position in the spectrum; simple properties of the rays as required to describe their use in medicine and in industry.

4. RADIO-ACTIVITY

The discovery of radio-activity; the nature of the radiations and their distinguishing properties. Half life; the limited number of naturally occurring atoms; the idea of extending the number.

Optional Topics (Physics)

5. THE STRUCTURE OF ATOMS

Discharge through gases and the positive part of the atom; Rutherford's scattering experiment and the nuclear atom; the size of the nucleus. The proton. The neutron. The various nuclei; atomic weight and atomic number; isotopes.

6. MATTER AND ENERGY

Conversion of mass to energy; the general idea of obtaining energy from an atom and from the uranium atom in particular; the chain reaction — controlled and uncontrolled; critical mass.

7. THE ATOMIC PILE

The structure of the pile; use of moderator and control rods; the production of radio-isotopes. Nuclear power stations. Nuclear power units for ships.

8. USING RADIO-ACTIVITY

Level checking in opaque containers; tracer techniques; thickness measurement; automatic level control.

9. DANGER AND SAFETY PRECAUTIONS

As applied to:

- (a) X-rays,
- (b) radio-activity,
- (c) atomic piles.

SECTION H SCIENCE OF SEAMANSHIP

1. SCIENTIFIC ASPECTS

Theory of machines — capstan winches; pulleys and purchases.

(Questions involving mechanical advantage, velocity ratio, efficiency and principle of work.)

2. VECTOR PROBLEMS

Use of the triangle and parallelogram of forces (graphical problems) (i) applications to three force problems on rigging and spars (ii) theory of propulsion of sailing boats — simplified — excluding resolution of forces and angle of attack.

3. CENTRES OF GRAVITY

Archimedes Principle. Centre of Buoyancy. Position of stable, unstable and neutral equilibrium as applied to boats. The effect of the change in density of water on displacement of vessels; (simple numerical problems involving rectangular vessels only).

4. MAGNETISM AND MARINER'S COMPASS

Basic knowledge of the principles of construction of the mariner's compass. Permanent and induced magnetism in ships. Elementary ideas on their cause and correction. Understanding of variation.

5. INSTRUMENTS

Principles involved and simple description of sextant, echo sounder, Kelvin sounding machine, rotator log, Pitot head log.

Optional Topics (Physics)

SECTION I MOLECULAR PROPERTIES

1. ELASTICITY

Change in the relative positions of molecules caused by stretching, compressing, twisting and deformation. Hooke's Law — use in spring balance. Elastic limit — yield point. Metal fatigue.

2. VISCOSITY

Resistance to flow. Internal friction in fluids. Streamline and turbulent flow. Action of a lubricant. Effect of temperature.

3. CAPILLARITY

Pores in substances. Relationship between radius of tube and height to which liquid rises. Examples of capillarity — blotting paper; bricks and mortar and need for damp courses; lamp wicks and heater wicks; conservation of moisture in the soil by hoeing. Differences between forces of cohesion and adhesion.

4. DIFFUSION AND OSMOSIS

Simple experimental evidence of these effects.

5. SURFACE TENSION

Downward attraction of molecules at surface. Needles and insects on water; proofing of tents; definite shape of water drops, soap bubbles and making of lead shot. Surface tension of soap solution, detergents and oil relative to that of water.

SECTION J OPTICAL INSTRUMENTS

Ideas of magnifying power as distinct from magnification. Factors which limit magnifying power in simple magnifying glass.

1. COMPOUND MICROSCOPE

Nature and relative position of elements. Type of final image formed. Use of eye ring. Need for illumination of object.

2. TELESCOPES

Elements of a simple refracting and simple reflecting telescope. Magnifying power and relative position of components. Erection of image. Similarity with radio telescope.

3. BINOCULARS

Astronomical telescopes with prisms to shorten overall length and erect image.

4. PROJECTORS

Use of condenser lens and mirror to give intense illumination of slide or film. Throw of projector lens and size of image on screen. Positioning of slide or film. Nature of lamp filament and power-ventilation.

5. CAMERA

As an optical instrument.

6. ENLARGERS

Use of condensers. Sources of light. Diffusion of light. Length of exposure, focal length of lens and size of negative.

Optional Topics (Physics)

SECTION K ASTRONOMY AND SPACE

1. Sun and solar system. Planetary distances, orbits, sizes, probable surface conditions. Theories on origin of planetary systems.
2. Earth as a planet. Day and night. Seasons.
3. Earth-moon system. Lunar month. Lunar phases.
4. Earth-moon-sun system. Tides, spring and neap. Eclipses, lunar and solar, total and partial.
5. Sun as a star. Brightness of stars. Types of star. Simple spectra. Light year.
6. Galaxies. "Milky Way."
7. Artificial satellites. Simple launching and orbit spacing procedure. Gravitational attraction and centrifugal force. Free-fall. Multi-stage rockets.
8. Deep space probes. Transfer orbits, e.g. Mariner II.
9. Use of telescopes, optical and radio.

SECTION L MUSICAL INSTRUMENTS AND
SOUND REPRODUCTION

1. SOUND
Musical scale, pitch, frequency, intervals in scale; relation with frequency. Octaves; harmonics; quality of sound.
2. PRODUCTION OF SOUNDS BY INSTRUMENTS
 - (a) Strings.
 - (b) Air column.
 - (c) Membranes.
 - (d) Oscillators.Harmonics and relationship to fundamental frequency.
3. HEARING SOUNDS
Audio-frequency response. Hearing losses. Loudspeakers and headphones. Resonance. Acoustics of rooms and halls.
4. RECORDING AND REPRODUCING SOUNDS
Microphone; pick-up; disc; loudspeaker. Tape recorder and record player to be studied as examples of energy conversion and storage. Hi-fidelity and stereo reproduction.

SECTION M FLIGHT

1. Decrease in atmospheric pressure with altitude. Altimeter as an aneroid instrument. Airspeed indicator as pressure difference gauge. Magnetic compass and principle of the gyro-compass.
2. Laminar flow, lift, turbulence, stalling, shock waves, compressibility effects, sweep back.

Optional Topics (Physics)

3. Forces on aircraft, lift, weight, thrust, drag. Lift: drag ratio. Composition and resolution of forces. Centre of gravity and stability of aircraft. Tailplane, dihedral. Turning movements, couples, three axes and three planes of reference. Control surfaces, elevator, ailerons, rudder.
4. Internal combustion four stroke engine. Airscrew, pitch. Gas turbine. Rocket motor. Force, mass, acceleration.
5. Buoyancy in gases. Balloons and airships. Displacement. Ballast.
6. Elementary navigation. Course and airspeed, wind velocity, track and ground speed. Triangle of velocities.

SECTION N THE PHYSICS OF THE MOTOR VEHICLE

1. The principles of the following:
 - (a) The engine: cylinders, cylinder head and block, plugs, piston and rings, crankshaft, sump, the four strokes of the piston, valves, cam-shaft, overhead and side valves, timing gear.
 - (b) The cooling system: water jacket, pump, radiator, convection currents, use of anti-freeze in winter.
 - (c) The ignition system.
 - (d) The carburettor.
 - (e) The chassis.
 - (f) The transmission system: clutch, gearbox, universal joints, crown wheel and pinion, differential, propeller shafts.
 - (g) Wheels, tyres and springs.
 - (h) Brakes.
 - (i) Electrical equipment: starter, lights, dynamo, battery, horn.
 - (j) The steering wheel.
2. Schools preparing for this option should give some instruction in driving technique, including the following:
 - (a) Steering and handbrakes.
 - (b) The pedals — use of accelerator, brake and clutch.
 - (c) The gearbox.
 - (d) Starting the car.
 - (e) Driving in the first forward gear and reverse.
 - (f) Using second, third and fourth gears.
 - (g) Double de-clutching.
 - (h) Use of driving mirror.

PRINCIPLES OF ACCOUNTS

GENERAL

The syllabus has been drawn up with two aims in mind:

- (a) To offer the pupils in secondary schools an opportunity to realise the importance of accounting in relation to their future as householders, as citizens and as employees, and to give to them the opportunity to learn the necessary technique of orderly recording to achieve this realisation.
- (b) To offer to the pupils who desire to make a career in the commercial world, an opportunity to specialise in this subject to such a degree that their skill and knowledge will be recognised by industry and commerce as a suitable criterion for entrance to professional examinations. It is also intended that the discipline needed for the award of such a qualifying certificate will be a sound preparation for future study.

The examination will test not only the pupils' accurate recording of transactions but also their understanding of the principles involved. The pupils should be able to explain the accounts prepared.

FORM OF EXAMINATION

The examination will be in TWO parts:

Paper I, covering Sections A and B of the syllabus (1½ hours)

Paper II, covering Section C of the syllabus (2½ hours)

Questions will be graded according to difficulty, the easiest questions being first. All questions will be compulsory.

SYLLABUS

SECTION A HOME ACCOUNTS

- (a) Balancing the household budget — allocation of money, e.g. food, clothing, insurances, rent or mortgage, rates, luxuries, hire purchase payments and instalments.
- (b) Simple cash book — receipts, wages and payments.
- (c) Household savings accounts, provision for paying the bills, monthly, quarterly and yearly.
- (d) Extra receipts and extra payments when starting a family, e.g. family allowance, holiday costs.

SECTION B COMMUNITY ACCOUNTS

- (a) Simple business documents, e.g. cheques and invoices.
- (b) Keeping the club, church or society accounts. Receipts and payments.
- (c) Opening a bank account — checking cash book with bank statement.
- (d) Spending for the neighbourhood and spending for the nation.

SECTION C BUSINESS ACCOUNTS

- (a) The history of and need for accounting in the business world. Simple cash records of receipts and payments, balancing. Limitation of a cash account only, need for analysis of receipts and payments as an intro-

Principles of Accounts

duction to double entry, debit and credit. Petty cash book and imprest system. The ledger, the cash account, other ledger accounts. Trial balance. Meaning of profit. Adjustment for and valuation of stock. Simple trading account, profit and loss account and balance sheet. Classification of accounts: personal, real and nominal. The recording of credit purchases and sales, returns inward and outward; the documents used in these recordings, invoices, debit and credit notes and statements. Trade and cash discount, three column cash book. Use of journal; opening entries, adjusting entries. Final adjustments; bad debts and provision for bad debts, outstanding expenses, payments in advance, depreciation. Methods of depreciation; straight line; diminishing balance and revaluation.

(b) PARTNERSHIPS. Capital accounts, current accounts, sharing of profits or losses. Appropriation account, partners' salaries, interest on capital. (Questions on the formation or dissolution of partnerships and the admission of a new partner will not be set.)

(c) COMPANY ACCOUNTS. Capital: authorised, issued, paid-up. Elementary appropriation account and balance sheet.

(d) NON-TRADING ORGANISATIONS. Receipts and payments account, income and expenditure account and balance sheet.

RELIGIOUS KNOWLEDGE

GENERAL

The syllabus is concerned with the whole child and its aim is not simply to present the Bible as a record of historical events but to bring children into an encounter with Jesus Christ. The importance of the Church, of worship and of Christian service should be stressed. The following points are considered to be of importance:

- (a) Christ should be presented in relation to both the Old and the New Covenants.
- (b) Emphasis should be placed on the relevance of the Christian Gospel to modern situations and problems.
- (c) Christ is to be presented as Saviour, as King, as the Life and the Way.

In the examination all quotations will be from the Revised Version of the Bible.

FORM OF EXAMINATION

The examination will comprise:

Paper I of 1½ hours preceded by 10 minutes for reading the questions (40%), on Part A of the syllabus.

Paper II of 1½ hours preceded by 10 minutes for reading the questions (40%), on Part B of the syllabus.

Course work (20%) (optional to schools in 1966).

PAPER I

This will contain:

- (a) thirty compulsory questions requiring short or one word answers;
- (b) ten multiple choice questions;
- (c) five questions involving short paragraph writing, of which candidates will be required to answer three; long sustained prose writing will not be required; a map question may be included;
- (d) five essay-type questions (including context questions) of which candidates must answer two.

PAPER II

This will contain:

- (a) fifteen compulsory questions requiring short answers;
- (b) ten multiple choice questions;
- (c) a number of questions requiring expanded answers from which candidates must answer four. Situation questions may be included.

In Paper II only, Bibles may be used (the A.V., R.V. or R.S.V., with the Knox translation for Roman Catholic candidates).

SYLLABUS

PART A

CHRIST: SAVIOUR AND KING

OLD TESTAMENT PASSAGES

(These passages are selected to introduce the main themes and could be dealt with briefly.)

1. The Story of the Creation and of the Fall.
2. God's Covenant with Abraham (Genesis 12, 1—3)
God's Covenant with Isaac (Genesis 26, 2—3)
God's Covenant with Jacob (Genesis 28, 11—15)

Religious Knowledge

3. Moses at the Burning Bush (Exodus 3, 1—10)
The Passover (Exodus 12, 1—13)
The Covenant in stone ratified with the Nation (Exodus 24, 1—12).
This is the Old Covenant. Jesus spoke of the New Covenant in His Blood (Luke 22, 20; I Corinthians 11, 25).
Jeremiah speaks of the New Covenant (Jeremiah 31, 31—33) and Paul refers to this in II Corinthians 3, 3.
4. The Messianic Prophecies in Isaiah:
The Prince of Peace (Isaiah 9, 2—7)
The Root of Jesse (Isaiah 11, 1—10)
A King (Isaiah 32, 1—8)
The Suffering Servant (Isaiah 42, 1—4; 49, 1—6; 50, 4—9; 52, 13 to 53, 12).
5. The Son of Man Daniel 7 (especially verse 13).

THE NEW TESTAMENT PASSAGES

1. The Birth of John the Baptist (Luke 1, 5—25; 1, 57—80; refer to Malachi 3, 1; 4, 5).
2. The Birth of Our Lord:
The Annunciation (Luke 1, 26—38)
The Visitation (Luke 1, 39—56)
The Nativity (Luke 2, 1—20)
The Wise Men and Flight to Egypt (Matthew 2, 1—23)
The Purification and Presentation (Luke 2, 21—40)
3. The Home background of Christ
Christ at Twelve (Luke 2, 40—52)
4. John the Baptist: The Forerunner of Christ (Isaiah 40, 3—5)
(Luke 3, 1—17)
5. The Baptism and Temptation (Matthew 3, 13—17; 4, 1—11)
6. The First Preaching in Galilee (Mark 1, 14—45)
The Rejection at Nazareth (Luke 4, 16—30)
The Call of the Twelve (Mark 3, 13—19)
7. Five Points of Opposition to Christ:
(a) He speaks with authority (Mark 1, 22)
(b) He forgives sins (Mark 2, 1—12)
(c) He mixes with sinners (Mark 2, 13—17)
(d) He breaks the Sabbath (Mark 2, 23—28)
(e) He breaks their Tradition (Mark 7, 1—8)
8. Feeding the Five Thousand (John 6, 1—15)
9. The Storm on the Lake (Mark 4, 35—41)
10. Jairus' Daughter (Mark 5, 21—43)
11. Caesarea Philippi (Matthew 16, 13—23)
12. The Transfiguration (Matthew 17, 1—23)

Religious Knowledge

13. The Journey to Jerusalem:
In the Samaritan Village (Luke 9, 51—56)
At Jericho (Bartimaeus and Zacchaeus) Luke 18, 35 to 19, 10)
14. Events of Holy Week
At Bethany (Lazarus) (John 11, 1—44)
Sunday: Entry into Jerusalem (Mark 11, 1—10)
Monday: The Cleansing of the Temple (Matthew 21, 10—17)
Tuesday: The Day of Questions
(a) of Authority (Mark 11, 27—33)
(b) of Tribute Money (Mark 12, 13—17)
(c) of Resurrection (Mark 12, 18—27)
(d) of the Greatest Commandment (Mark 12, 28—34)
The Parable of the Wicked Husbandmen (Mark 12, 1—12)
Wednesday: The Anointing of Christ (Mark 14, 3—9) and
The Betrayal (Luke 22, 3—6)
Thursday: Preparation for the Passover (Luke 22, 7—13)
The Last Supper (Mark 14, 22—31)
Gethsemane
The Betrayal and Arrest
The two main trials: (i) Before the Sanhedrin —
“Art thou the Christ?”
(ii) Before Pilate —
“Art thou a King?”
Friday: The Crucifixion
The Veil of the Temple
The Burial
(*N.B.*—For the Passion Narrative, all the Gospels should be used.)
15. The Resurrection:
The Women at the Tomb (John 20, 1—18; Matthew 28, 1—10)
The Road to Emmaus (Luke 24, 13—34)
In the Upper Room at Jerusalem (Luke 24, 36—49; John 20, 19—31)
Peter by the Sea of Tiberias (John 21)
Paul's record (I Corinthians 15, 3—8)
16. The Ascension (Acts 1, 6—14; Matthew 28, 18—20; Mark 16, 19—20)
17. Another Comforter (John 14, 16—17 and 26)
18. Pentecost (Acts 2).

PART B

CHRIST: THE WAY AND THE LIFE

1. THE GREAT COMMANDMENTS (Luke 10, 25; Mark 12, 28—34)
The essence of religion and the ultimate authority for all problems. This should be linked with the Old Covenant — especially the Ten Commandments (Exodus 20, 1—17). The Nature of Love (Agapé) (I Corinthians 13).

Religious Knowledge

2. THE NEW EMPHASIS

Christ stresses the importance of motives (Matthew 5, 17—48).
To be pure in heart, Grace is needed (John 15, 1—10).

3. THE KINGDOM OF GOD

Parables of the Kingdom (Matthew 13, 24—52)

4. THE QUALITIES ACCEPTABLE IN THE IDEAL CITIZEN:

As revealed in the Beatitudes (Matthew 5, 1—16)
Child-likeness (Mark 10, 13—16; Matthew 18, 1—5)
Humility (Matthew 23, 11—12)
(Mark 10, 35—45)
Forgiveness (Luke 15; Matthew 18, 21—35;
Luke 17, 3—4; Luke 23, 34 and
39—43)
Faith (Trust and Loyalty to God in Christ):
The Syro-Phoenician (Mark 7, 24—30)
The Centurion's Servant (Luke 7, 1—10)
The Epileptic Boy (Mark 9, 17—29)
Jesus in Gethsemane — Loyal to death (Luke 22, 39—46)
Self-Denial (Matthew 16, 24—26)

5. THE KINGDOM IN ACTION

(a) The Family:

The Fatherhood of God
Honour of Parents (Matthew 15, 4—6 and Luke 2, 51—52)
Husband and Wife (Matthew 19, 3—9 and Matthew 5, 27—32)
The Ideal Wife (Proverbs 31, 10—31)
The Relationships of a Christian Home (Ephesians 5, 22 to 6, 4)

(b) Friendship and Loyalty (in Personal Relationships):

The Closer Circle of Friends: Jesus calls the disciples
(Mark 3, 13—19)
Mary and Martha (Luke 10, 38—42)
The Wider Meaning of Friendship: Jesus, the friend of Publicans
and Sinners.
The Story of Levi (Mark 2, 14—17); Zacchaeus (Luke 19, 1—10).
The implications of such friendships — (duty, care, protection and
help, etc.).

(c) Stewardship:

(i) The Christian attitude to work:

Jesus the Carpenter (Mark 6, 3)
The Parable of the Talents (Matthew 25, 14—29)
The Unjust Steward (Luke 16, 1—8)
The Labourers in the Vineyard (Matthew 20, 1—15)
Paul's teaching (II Thessalonians 3, 7—12; Acts 18, 1—4)

(ii) Money and its uses.

The dangers of covetousness and wealth.
The Rich Young Ruler (Mark 10, 17—30)
The Two Brothers
The Rich Fool (Luke 12, 13—21)
True riches (Matthew 6, 19—34)
True generosity in giving (Mark 12, 41—44)
Christian sharing (Acts 2, 41—47)

Religious Knowledge

(iii) Leisure and its uses:

In service to others;

The Last Judgement (Matthew 25, 31—46)

The Good Samaritan (Luke 10, 25—42)

Paul's Teaching (Romans 12)

(This should be linked with Community Service, which can be performed both as individuals and as members of some organisation. The Good Samaritan may be used to introduce the subject of Race Relationships.)

The Sabbath Day (Mark 2, 23 to 3, 5)

Rest and Refreshment (Mark 6, 30—32)

(d) Prayer:

The Prayer-Life of Jesus (Mark 1, 21; Luke 6, 12—16; 22, 39—46)

Christ's Teaching on Prayer (Luke 11, 1—13; 18, 1—14; Matthew 18, 19—20)

(e) The Worshipping Community:

Christ in Synagogue and Temple

Sincerity in Worship (Matthew 12, 7; 6, 5—18)

Also other relevant passages in Old and New Testaments, e.g. Amos 5, 21—24; Isaiah 1, 10—17)

The Worship and Fellowship of the Early Church in Jerusalem (Acts 1—4)

COURSE WORK

For the 1966 Examination, Course Work will be optional and for 1967 onwards compulsory. This is an option to schools and not to individual candidates.

This will take the form of a project intended to give pupils the opportunity to show that they have themselves made a study of an appropriate subject in some depth and over a period of time during the two years prior to the examination.

1. The subject will be relevant to Christianity.
2. It will be selected as a result of consultation between pupil and teacher.
3. The subject, together with an outline treatment, must be submitted to the Board for approval by the end of September before the examination.
4. It will be presented as a folder or loose leaf file or in a suitable exercise book.
5. It will extend to a minimum of 1,500 words.
6. Illustrations, photographs, diagrams and models may be presented as part of the project.
7. A list of contents and a bibliography will be required, and, where appropriate, a detail of visits or interviews.
8. The work is to be regarded as confidential for three years.
9. The project will be assessed by the teacher.

In arriving at the assessment the assessor must be satisfied:

- (a) that the work has been done by the pupil;
- (b) that the pupil understands what he has written (an Oral Test should be made);
- (c) that a significant proportion of the work is in the pupil's own words;
- (d) that there is evidence of reading, selection of material, investigation and, depending on the subject, observation and involvement;

Religious Knowledge

(e) that the work is presented neatly and in a logical and orderly manner;

(f) that the contents are relevant to the title.

The following list of subjects is intended as a guide.

1. My Church.
 2. The churches in my town.
 3. Church Unity
 4. British Red Cross
 5. The Girl Guides.
 6. Oxfam.
 7. A man of science.
 8. A man of industry.
 9. A missionary.
 10. A reformer.
 11. The writing of the Bible.
 12. One Bible author.
 13. One Bible translator.
 14. The New English Bible
 15. The British and Foreign Bible Society.
 16. A Bible character.
 17. The Monasteries.
 18. The Crusades.
 19. Christian Stewardship.
 20. Television advertising.
 21. Voluntary Service.
 22. N.S.P.C.C.
 23. U.N.O.
 24. The Colour problem.
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RURAL STUDIES

FORM OF EXAMINATION

The examination will comprise *FOUR* parts:

- Part I Written paper of 2½ hours (50%)
- Part II Practical examination consisting of
 - (a) Practical Tests (25%)
 - (b) Continuous Assessment (15%)
 - (c) Assignments, Themes or Projects and Oral Test (10%)

PART I WRITTEN PAPER

This will consist of two sections.

Section A will be based on Section I of the syllabus and will contain a number of questions requiring short answers from which candidates will have a choice. Candidates will be advised to spend about 45 minutes on this section. 40% of the marks for the written paper will be allocated to Section A.

Section B will be based on Section II of the syllabus. Candidates will be required to answer four questions, of which at least one must be answered from Section II(a) and at least one from Section II(b) or II(c).

PART II PRACTICAL EXAMINATION

(a) Practical Tests.

These will consist of common tasks carried out on the garden or farm, e.g. seed sowing, pricking or planting out, digging, pruning, use of tools, machinery and management of such livestock as may be kept at the school.

(b) Continuous Assessment.

An assessment will be required of the work done during the last two years of the course. It is suggested that the assessment could be made in the following manner:

1. WILLINGNESS TO LEARN

The pupil

- (a), (b) accepts direction and follows instructions carefully and enthusiastically, showing initiative;
- (c) accepts direction and follows instructions carefully but with little initiative;
- (d), (e) resents direction, is forgetful, easily distracted.

2. CO-OPERATION

The pupil, working with others,

- (a), (b) takes the lead, accepts suggestions, does more than his share of the work;
- (c) does his share of the work;
- (d), (e) does less than his share if he can get away with it; deliberately leaves unpleasant tasks to his fellows; is first away from the job.

3. SELF CONFIDENCE AND LEADERSHIP

The pupil shows that he

- (a), (b) can take initiative, is not afraid to try out his own methods, accepts leadership in group activities;
- (c) will accept leadership when he has had greater experience of the operation than his fellows, (i.e. with a group of younger children);
- (d), (e) does not like to be in a position of responsibility; fails to set standards of encouraging others.

4. IDEALS, ETC.

The pupil has shown,

- (a), (b) a care for plants and animals over and above normal (he has stayed late to make sure transplanted trees were watered in or has fed the rabbits at some inconvenience to himself);
- (c) care and interest in dealing with plants or animals;
- (d), (e) little appreciation of the needs of living things; neglect of them for his own convenience on occasions.

5. APPRECIATION

The pupil has shown

- (a), (b) good judgement in choosing flowers, and appreciation of quality in plants; success in judging animals, and pride in the condition of animals under his care;
- (c) an appreciation of good plants and animals at shows or in the school garden;
- (d), (e) little or no appreciation of quality or delight in beautiful flowers or animals.

6. PERSONAL STANDARDS

The pupil

- (a), (b) sets himself high standards in his work, finishes off jobs even after time, puts tools away properly; has a feeling of personal satisfaction in a job well done;
- (c) likes to see his work bear comparison with others; keeps tools clean and tidy without being reminded;
- (d), (e) has poor standards; does not mind being known for poor untidy work.

7. INTEGRITY

The pupil

- (a), (b) can always be relied upon to carry out any work he undertakes to the limit of his ability;
- (c) is reliable and punctual; does not require more than occasional supervision;
- (d), (e) cannot be relied upon to work unsupervised.

8. PERSEVERANCE

The pupil

- (a), (b) can work without becoming bored at a project or task over a period, showing initiative and building up interest;
- (c) can work satisfactorily for reasonable periods;
- (d), (e) is easily bored or distracted.

Teachers are advised to award marks, for each of the eight characteristics, as shown below, and to take the average to obtain the final mark.

Categories: (a) 13 — 15 marks

(b) 10 — 12 marks

(c) 7 — 9 marks

(d) 4 — 6 marks

(e) 1 — 3 marks

(c) Assignments, Themes or Projects and Oral Test.

This may consist of an individual study folder and/or book and/or collection(s) and/or rural craft work to show evidence of the careful study of a particular aspect of Rural Studies. Candidates will be required to take an oral test in which questions may be asked on such subjects as identification of seeds, weeds, plants, fertilisers, and pests and diseases common to the school garden or farm. In addition, questions may be asked on Crop Husbandry, Animal Husbandry, Machinery or any other aspect of the syllabus including the candidate's chosen project study.

SYLLABUS

SECTION I GENERAL

SOIL: formation, weathering agents, top soil and subsoil; composition by mechanical analysis, mineral particles, sand and clay; soil types and their recognition, loams; soil porosity, soil water, water table, availability, mineral salts, acidity, simple measurement of PH value, importance of lime; humus importance and formation; manures and fertilisers — N.P.K. Organic and inorganic soil colour and aspect in relation to heating; soil life — earthworms, bacteria and other soil organisms; soil — air and temperature — basic comparison; cultivations and their effects; implements.

WEATHER AND CLIMATE: the seasons and climate; weather records and measurement; the water cycle; rain, frost, dew.

PLANT AND ANIMAL BIOLOGY: characteristics of living organisms — plants and animal organisms — plants and animals; elementary principles of breeding and inheritance.

PLANT BIOLOGY: simple external and internal structure of a typical flowering plant—roots—stem—leaves—flower and fruit; functions of plants; germination and growth — respiration, transpiration, photosynthesis, absorption, response to stimuli; interdependence of plant and animal life — the carbon and nitrogen cycle; propagation of plants by seed and vegetative methods, seed dispersal, annuals, biennials and perennials; recognition only of common plants (flowering stage) trees and shrubs, including:

PLANTS: buttercup, wallflower, sweet pea, dead nettle, primula, perennial ryegrass, cocksfoot, Timothy, couch, annual meadow grass.

TREES: common oak, sycamore, beech, ash, larch, horse chestnut, sweet chestnut, birch, scotch pine, lime and common elm.

SHRUBS: forsythia, ribes, philadelphus, hydrangea, buddleia, weigelia (diervilla), berberis, cotoneaster, pyracantha.

FARM CROPS: wheat, barley, oats, red and white clover, kale, turnips, mangolds, sugar beet and potatoes.

ANIMAL BIOLOGY: to be related to the garden and farm and to include examples from small livestock, poultry, bees, farm animals; simple forms of animal life — the earthworm, insects, birds, mammals, external and internal features, digestion, respiration, circulation and reproduction.

Simple study of the principles and application as applied to Rural Studies of the following:

- (a) composition of the air, oxidation;
- (b) conduction, convection and radiation;
- (c) expansion and contraction of gases, liquids and solids;
- (d) internal combustion engine (2 and 4 stroke cycles).

SECTION II

(a) **PLANT HUSBANDRY**

General: methods of cultivation — reasons and effects upon soil and crops; tools used in the garden and farm and their correct use and maintenance; manures and fertilisers — N.P.K. and lime — their effects on soils and plants; seed and potting composts.

PESTS AND DISEASES: recognition of damage, life history, prevention and control of the following:

- (i) a leaf-eating insect;
- (ii) a sap-sucking insect;
- (iii) a fungus;
- (iv) insects as virus vectors;
- (v) birds.

BENEFICIAL INSECTS AND BIRDS:

WEEDS: recognition of commonly occurring weeds and their control.

VEGETABLE AND CROP GROWING: planning the garden, seeds, varieties of plants — roots, brassicas, legumes and potatoes; rotation of crops — successional crops, intercropping; preparation of soil-sowing and planting, thinning, transplanting, harvesting and storing of various vegetable crops; common pests and diseases of vegetable crops.

FRUIT GROWING

SOFT FRUITS: the propagation and management of blackcurrants, red currants, gooseberries, raspberries, loganberries, cultivated blackberries and strawberries; varieties in general use.

TOP FRUITS: the propagation and management of apples, pears, stocks, budding and grafting, pruning, varieties of fruit; common pests and diseases of fruit.

ORNAMENTAL GARDENING

ORNAMENTAL PLANTS: the recognition, propagation and cultivation of the more common garden plants as follows:

- (a) annuals, hardy and half hardy;
- (b) biennials and herbaceous perennials;
- (c) ornamental trees and shrubs.

ORNAMENTAL FEATURES: the design and maintenance of the ornamental garden with special emphasis on one feature such as lawn, formal or informal bedding, rock garden or rock pool.

CULTIVATION UNDER GLASS

Greenhouses, garden frames and cloches: their use in producing

- (i) a more intensive use of cropping area;
- (ii) an extension of the growing season;
- (iii) creating artificial climates for plants of different climes;
- (iv) cultivation of pot plants, bedding plants and greenhouse crops.

Some problems associated with glass; temperature variation, ventilation, watering and sterilisation.

(b) ANIMAL HUSBANDRY

(This section is intended to cater for those schools with facilities for studying one or more of the animals included in the scheme.)

Animals as producers of food — poultry, rabbits, pigs, cattle, goats, sheep and bees.

POULTRY KEEPING: breeds and types — crosses — breeding and rearing — sex linkage, natural incubation compared with artificial methods; development of embryo and hatching; egg production, good laying stock, systems of housing and feeding; common pests and diseases; table poultry — commercial methods, broilers, feeding and records, marketing of eggs, chemical caponisation; killing, plucking, singeing; trussing and preparation for table. Elementary knowledge of common breeds and incubation period of ducks, geese, turkeys.

Rural Studies

RABBIT KEEPING: breeds and types — breeding and rearing; housing; hutches and runs; modern balanced foods; good and harmful plant foods; common diseases; fur production, moulting, pelting, preparation of skins; table rabbits.

PIG KEEPING: breeds, origins, bacon and pork breeds, commercial crosses; breeding and rearing — selection of breeding stock, service, care of breeding gilts and sows, farrowing, feeding of sows and litters, weaning, marketing, recording; housing, feeding, marketing, pig products; common diseases.

GOATS: breeds, origins, breeding and rearing, selection of breeding stock; care of breeding males and females; feeding of pregnant females and kids; weaning, recording, housing, feeding; common diseases.

SHEEP: breeds and their uses; importance of meat and wool; lowland and hill sheep farming and their inter-dependence; the shepherd's year to include culling, flushing, tupping, winter feeding, lambing, weaning, the sale of lambs, shearing, dipping; common diseases and pests.

CATTLE

DAIRY CATTLE: breeds and their economic importance — yields, milk quality; distribution of breeds; breeding — herd improvement; A.I., milk records, management of cows for milk production; simple structure of the udder; lactation period; principles and practice of clean milk production; hand and machine milking routine; pasteurisation; marketing of milk; dairy products.

FEEDING: feeding standards, protein and starch equivalent; bulk; balancing rations; maintenance ration and production rations.

REARING: preparation for calving, calving, systems of calf rearing and weaning; calf ailments and their prevention.

BEEF CATTLE: breeds and their crosses, economic importance, feeding for beef; traditional and modern systems, baby beef; conversion ratios; common diseases in cattle; mastitis; contagious abortion; milk fever.

BEE-KEEPING: recognition and metamorphosis of the three castes of the bee colony; anatomy of the worker bee; hives used in bee-keeping, single and double walled hives, skep; main sources of nectar and pollen collection and use of these foods; bees and pollination; communication among bees — the colony; operations — wintering, spring cleaning, swarming, summer care; honey production, beeswax; notifiable and common diseases.

SOME KNOWLEDGE of the digestive, reproductive and excretory systems of the animals studied will be expected.

ANIMAL HEALTH: symptoms and control of notifiable and such common pests and diseases as tuberculosis, B.W.D., fowl paralysis, coccidiosis, parasitic worms, anaemia, foot rot, liver fluke, mastitis, warble fly and scours.

(c) ENVIRONMENTAL STUDIES

This section may be useful to schools having limited facilities for practical gardening or livestock keeping.

FARM STUDIES: the organisation of a typical farm in the district; mixed and specialised farming — influence of soil aspect and markets on type of farming and of livestock.

Rural Studies

ARABLE FARMING: cash crops — wheat, barley, potatoes, sugar beet; forage crops — oats, beans, kale, leys, permanent grass; characteristics of various grasses and mixtures; haymaking, silage, grass drying; harvesting and storage; weed control on the farm — diseases and control; use of manures and fertilisers on the farm; farm machinery, tractors, implements; safety precautions.

LIVESTOCK FARMING: breeds of farm livestock where applicable, recognition of main breeds of cattle, sheep, pigs and poultry; the purpose of certain breeds, beef or dairy, dual purpose breeds, wool or mutton, pork or bacon, eggs or table birds; points of good livestock; breeding and rearing; housing cattle, pigs, poultry; feeding and caring of animals on the farm, rations, concentrates, succulents, roughage; grazing and folding; short and long term leys; special purpose forage crops; animal health — control of common diseases.

MARKET GARDENING: the influence of soil, climate and markets — on choice of site and crops grown; methods of intensive market gardening, nursery gardening; commercial glasshouses production, markets, modern marketing methods.

PARKS AND GARDENS: general features, seasonal cycle and variety of work; aesthetic and educational value to the community.

FORESTRY: studies to be based on a given area of forest land which provides facilities for practical work and observation; the influence of soil, drainage, climate and aspect on the type of tree planted; weeds as soil type indicators; suitability and selection of species; the importance of forestry in national economy; study of trees — life cycle — nursery work in forestry, seeds and transplanting; routine operations in forestry; seed collection, selection of trees for felling and thinning, brashing, protection of seeds, seedlings and young trees, insects, fungi, disease, fire danger, prevention and control; measurement and selection of mature trees, tools and machines in use; the animal life of the forest — plants of forest land; identification of forest trees at all seasons; timber — its uses — felling, seasoning, hardwoods and softwoods.

ECOLOGICAL STUDIES

The study of any of the following communities:

(i) waterland; (ii) field; (iii) hedgerow; (iv) pond or stream; (v) the sea shore; (vi) aquaria; (vii) vivaria; (viii) domesticated animals; (ix) birds and mammals of farm and garden — beneficial and harmful; migration, hibernation. Man's place in nature and the conservation of natural resources.

SCIENCE

GENERAL

1. The syllabus is extremely broad, covering as it does a five year course, but the choice of questions will allow for this. The examination should not be allowed to dominate the order in which the topics are presented.
2. The syllabus is sectionalised for convenience in locating the items, and schools may prefer to re-arrange the order of work for teaching purposes.
3. All treatment will be qualitative, except where otherwise stated.
4. In the practical work, emphasis should be placed on a wide variety of experiments carried out with simple equipment, and where appropriate, simple original investigations should be encouraged.
5. It is hoped that schools will relate matters within the syllabus to local conditions and the environment of the school (i.e. local industrial processes or rural environment).

FORM OF EXAMINATION

There will be two written papers each of $1\frac{1}{2}$ hours (50%), a practical examination of $2\frac{1}{4}$ hours (30%) including 15 minutes for reading the questions and planning, and an assessment of course work (20%).

Each theory paper will contain short and long answer questions set to test reasoning and deduction.

SYLLABUS

PART I

SECTION A

Density and its practical application; Flotation; the common hydrometer and its uses; atmospheric pressure and its application; lift and force pumps, siphons, bicycle pumps. Force — weight as a force. Principle of moments (see also 2A); the force of gravity.

SECTION B

Atoms and molecules (symbols and simple formulae of substances in the syllabus); elements and compounds; mixtures and their separation; the solvent action of water and other solvents; common substances; the dependence of solubility on temperature; the importance of dissolved gases for aquatic life; physical and chemical changes; the most important constituents of the air and their properties; the preparation, properties and uses of oxygen; rusting, corrosion and their prevention; acidic and basic oxides. Acids, bases, alkalis, neutralisation, salts (carbonates and salts produced by the three common mineral acids). The electrolysis of water; the properties and uses of hydrogen; the synthesis of water by combustion of hydrogen. Hardness of water, water softening, the action of soaps, detergents and bleaching agents. Carbon, diamond, graphite and charcoal. Coal and the gas works (simple treatment and mention only of by-products). The formation of carbon dioxide in everyday life by the combustion of carbon fuels and food and by fermentation. Uses of carbon dioxide (see also 5C). The occurrence of carbon monoxide, its poisonous effect.

PART II

SECTION A

Energy and its forms and conversion. Levers (see also 1A and 5A). The internal combustion engine (two stroke, four stroke and diesel; see Part 3). An outline of the rocket engine and its application to space travel. Friction and lubrication.

SECTION B

Thermal expansion of solids, liquids, gases (especially water); change of state; water cycle (see 1B); cooling by evaporation; atmospheric humidity; thermometers; Centigrade and Fahrenheit scales and conversion (Celsius); (conversion by graphical method only); conduction, convection, radiation; therm, calorie, kilo-calorie; specific heat.

SECTION C

Sound, its nature and transmission. Echoes, loudness, pitch and its practical application to musical instruments (see also 5A — hearing). Reflection of light on plane surfaces; refraction (air, glass, water); lenses — focal length, nature of image formed (graphical method only); use of lenses, magnification and projection; the camera; the eye, accommodation, long and short sight (including correction). Spectrum, colour, including simple treatment of infra-red and ultra violet.

PART III

Simple properties of magnets and magnetic substances; the Earth as a magnet; common applications of magnets; the magnetic compass; magnetic induction, fields of force; circuits (simple series and parallel circuits incorporating switches, lamps and a power supply); dry cell; good and bad conductors (idea of resistance); insulators; three effects of a current — chemical, magnetic, heating; electrolysis of copper sulphate; care of accumulators; electro-magnets and their uses; the electric bell; electric motor (simple two pole); simple treatment of alternating current; the bicycle dynamo; the transformer and induction coil. The carbon microphone and telephone earpiece as an extension of the simple circuit. Housewiring, fuses, earthing — use and care of domestic electrical equipment. Electrical units and their measurement (use of voltmeter, ammeter, $W=VA$ and Kwh).

PART IV

The solar system (use of models to indicate scale); the galaxy; meaning of a light year.

PART V

SECTION A

The distinctive features of mammals as illustrating the characteristics of living organisms; the skeleton; movements of the limbs; muscles and leverage; the essential constituents of the diet of mammals (carbohydrates, fats, proteins, minerals, vitamins); simple tests for starch, sugars, fats and proteins.

Science

The alimentary canal; the meaning of digestion and absorption of food; the properties of enzymes and enzyme action; the action of ptyalin; the structure, functions and circulation of the blood; respiration, excretion and sexual reproduction; the sense organs, touch, taste, smell, sight (see also 2C), hearing and balance; voluntary and involuntary reactions to surroundings; learning and behaviour, temperature control.

SECTION B

The external features of flowering plants and trees; the functions of the root, stem and leaf; the soil, its formation, constituents; the absorption of water by plants and the importance of salts; transpiration, photosynthesis, food storage; Aerobic respiration in plants; the structure of a flower from a study of simple examples; pollination; a simple treatment of fertilisation; the formation of fruits and seeds; general principles of dispersion; germination and growth; tropisms.

SECTION C

The essential features of living cells; cells as units of higher organisms; the distinctive features and advantages of asexual and sexual reproduction; carbon, an essential constituent of organisms; the importance of micro-organisms in the decay of organic matter; the circulation of carbon and nitrogen in nature and in disease; preservation of food; modes of infection by disease-producing organisms; prevention of infection, immunisation.

PRACTICAL EXAMINATION

Each candidate will be allowed 15 minutes to read the questions and inspect the apparatus. The practical examination will then occupy a period of 2 hours and five questions will be set.

It will be the aim of the practical examination to test the application of scientific knowledge and scientific method.

TEACHER'S ASSESSMENT

This should be based on a number of the facets of the work in science done by each pupil. This assessment will be required before the written and practical examinations take place.

The following suggestions are made for the guidance of teachers:

- (a) The practical work of years four and five will form the basis of the assessment. Evidence of pupils' practical work should be kept for moderation.
- (b) Regard should be paid to factual knowledge, understanding of scientific principles, and ability to apply them in a new situation (this could be assessed by means of a short oral examination).
- (c) A pupil's scientific initiative and general practical dexterity will be assessed on his ability in setting up experiments.
- (d) Hobbies, reading and liveliness of interest in science should also be taken into account.
- (e) The teacher will assess the individual part played in project work.
- (f) At the conclusion of any project work the teacher will discuss the work with the pupil to test for insight. This should be immediately prior to the teacher's submission of the assessment to the Board.

SHORTHAND

Candidates may take either Shorthand (50/60 w.p.m.) or Shorthand (70/80 w.p.m.) or both.

Papers will be set in the Pitman system. If schools require examination in any other system, written notice must be given to the Board annually not later than 30th September before the examination.

FORM OF EXAMINATION

The examination will comprise:

50/60 W.P.M.

1. The transcription of a passage of printed shorthand, of approximately 150 words, with outlines appropriate to these speeds. 30 minutes will be allowed for transcription.
2. The dictation of:
 - (a) two passages each of one minute and two passages each of two minutes at a speed of 50 w.p.m.;
 - (b) two passages each of one minute and two passages each of two minutes at a speed of 60 w.p.m.

At each speed one of the two minute passages will be a business letter, and the other three passages will be of a general nature. Candidates must transcribe *either* the passages dictated at 50 w.p.m. *or* those dictated at 60 w.p.m.

After the dictation 70 minutes will be allowed for transcription, including five minutes for the perusal of notes.

70/80 W.P.M.

1. The transcription of a passage of printed shorthand, of approximately 150 words, with outlines appropriate to these speeds. 30 minutes will be allowed for transcription.
2. The dictation of:
 - (a) two passages each of one minute and two passages each of two minutes at a speed of 70 w.p.m.;
 - (b) two passages each of one minute and two passages each of two minutes at a speed of 80 w.p.m.

At each speed one of the two minute passages will be a business letter, and the other three passages will be of a general nature. Candidates must transcribe *either* the passages dictated at 70 w.p.m. *or* those dictated at 80 w.p.m.

After the dictation 85 minutes will be allowed for transcription, including five minutes for the perusal of notes.

GENERAL

1. Candidates will be given the choice of submitting either handwritten or typewritten transcripts.
2. In both the 50/60 w.p.m. and the 70/80 w.p.m. examinations marks will be allocated as follows:

Passage of printed shorthand	10%
Two 1 minute passages (15% each)	30%
Two 2 minute passages (30% each)	60%

Shorthand

3. In marking, accuracy of transcription only will be taken into account. One mark will be deducted for each error in essential punctuation and spelling. In the dictated passages two marks, and in the printed passage one mark, will be deducted for each transcription error. Recurring errors will be penalised once only.

4. Candidates will be graded according to the following scale:

90% — 100%	Grade 1
75% — 89%	Grade 2
65% — 74%	Grade 3
50% — 64%	Grade 4
49% and under	Grade 5 or ungraded

SPANISH

GRAMMAR

The amount of grammar to be taught and the way it is treated are matters left to the discretion of the teacher, who will not need to be reminded that comprehension and expression are the essential elements to be encouraged. As formal translation has no place in the examination, especially difficult grammatical features such as the subjunctive mood (in so far as they will occur) will not require special study.

VOCABULARY

The words which candidates will be expected to know are those associated with such common modern topics as the classroom, school life, body and dress, food and meals, travel, seaside and countryside, shopping and street, home life in both England and Spain, sports and amusements, etc., supported by useful expressions and idioms of obvious practical value.

FORM OF EXAMINATION

The examination will comprise:

- (a) Paper 1 (i) Aural Comprehension (approx. 30 minutes)
(ii) Free Composition (45 minutes)
- (b) Paper 2 Dictation Test (30 minutes)
- (c) Paper 3 (75 minutes)
 - (i) Comprehension (written Spanish answers)
 - (ii) Comprehension (written English answers)
 - (iii) National Life and Background
- (d) Oral Test

1. WRITTEN TESTS

- (a) Free composition (20%).

Candidates will be expected to write about 120 words on one of three forms of free composition. These will be (a) a letter (b) a topic related to everyday life (c) an expansion of a complete story expressed in a series of pictures and an outline.

- (b) Comprehension (5%).

After studying a passage of about 150 words in Spanish, candidates will be asked a number of questions *in Spanish* based on the passage. Three answers *in Spanish* to each question, taken as far as possible from the passage, will be provided and the candidate required to choose and write down the one he believes to be correct.

- (c) Comprehension (15%).

Candidates will be required to answer briefly *in English* a number of straightforward questions, also *in English*, based upon a passage of Spanish of about 150 words in length.

- (d) National life and background (5%).

There will be a choice of ten from fifteen sub-questions *in English* on those aspects of Spanish life and background (e.g. geography, customs, etc.) which are normally and incidentally touched upon in the course. Three possible answers to each question will be provided and the candidate required to choose and write down the one he believes to be correct.

Spanish

2. AURAL TESTS

(a) Dictation (10%).

The passage will be read first at a normal pace to give the candidates a general impression of its nature. Each short sense group will then be read three times, the candidate being allowed adequate time to write it down. After an interval of three minutes to enable revision to take place, the passage will be given a final reading at a rather slower than normal pace, a brief pause being made after each full stop. The candidate will then be allowed a further three minutes for revision before the scripts are collected. All punctuation will be given in Spanish and names of people and places written on the blackboard, or otherwise provided.

(b) Comprehension (15%).

This test will consist of 15 sentences, simple in style, vocabulary and subject matter, but lacking concluding sections. The candidate will have before him on his question paper five possible concluding sections to each of the incomplete sentences. The examiner will read a sentence three times, after which the candidate will *either* write on his script *or* record on tape the section he considers to be the correct one. In marking, no account will be taken of spelling, grammar or pronunciation, evidence of correct *comprehension* being the only factor sought in this test.

The choice between writing or recording the concluding sections will have been made in advance by each school, according to the facilities available.

3. ORAL TEST

All candidates will normally be examined. The oral examination will usually be conducted by the candidate's own teacher, in the presence of a colleague from another school, invited by the Board to attend. Both examiners will award marks independently and will submit them to the Board.

(a) Reading (5%).

The candidate will read a passage of about 100 words of fairly simple everyday Spanish, which will include a few lines of conversation, such as would have been encountered while studying the topics suggested above. Five minutes will be given for preparation of the passage. No questions will be asked on its subject matter.

(b) Conversation (20%).

This will be based on (a) *either* a picture or series of related pictures *or* course work if submitted *and* (b) informal general conversation.

(c) A maximum of 5% will be awarded on the school's valuation of the candidate's attitude and response to oral work.

Typewriting

TYPEWRITING

FORM OF EXAMINATION

The examination will consist of ONE paper of 2½ hours containing TWO sections.

Questions in Section A will be compulsory. Candidates who satisfy the examiner in this section only will be awarded Grade 4 or Grade 5. In Section B there will be a choice of questions. Marks will be equally divided between Section A and Section B.

NOTES:—*Dictionaries may be used for both papers. In the Copying Test no erasing will be allowed; any type of erasing may be used in all other tests. Unsatisfactory erasing will be penalised. Any recognised method of spacing following punctuation marks will be accepted as long as it is used consistently throughout the examination. Each candidate will be supplied with a folder containing paper of various sizes, forms, envelopes and carbon paper, and must use the appropriate paper for each question. Additional paper will not be supplied.*

SYLLABUS

SECTION A

This section will consist of:

- (a) a copying test of 500 words. Candidates will type as much as they can in 10 minutes. The passage will be in imitation typescript and will have set line endings. Double line spacing will be used and foolscap paper will be provided. A minimum speed of 25 w.p.m. will be expected of the average candidate. A speed of 25 w.p.m. or more reached in the Copying Test will be endorsed on the certificate;
- (b) a business letter with or without centred heading with carbon copy or separate envelope from simple manuscript using only elementary correction signs. Matter will be of general commercial content. Candidates will be expected to have a knowledge of the essential parts of a business letter. Letter headed paper will be supplied;
- (c) a simple tabular piece from clearly written manuscript with no corrections. Pen and ink, ball pen or underscore ruling will be allowed. **Mixed ruling will not be allowed.**

SECTION B

Four questions will be set on any or all of the following:

- (a) Business letter.
- (b) Free display e.g. programme, menu, advertisement, notice.
- (c) Minutes or agenda.
- (d) Printed form, e.g. invoice or advice note.
- (e) Principal parts of specifications.
- (f) Tabulation.

Candidates may not attempt more than three questions in this section.

WOODWORK

FORM OF EXAMINATION

The examination will comprise:

- (a) Course Work (40%, of which not more than 5% may be allocated to an optional personal study notebook).
- (b) A practical test of 2½ hours (40%). 15 minutes will be allowed for studying the paper before starting the test.
- (c) A theory paper of 1½ hours (20%).

Good work in one part of the examination will not compensate for bad work in another part in determining the final grade.

COURSE WORK

Free choice may be made of any woodworking craft. Any number of pieces of work completed in the two years prior to the practical test may be taken into consideration. Quality rather than quantity will be expected. If necessary work not quite completed may be taken into consideration.

PRACTICAL TEST

The practical test will be based mainly on basic woodwork constructions and will be a test of skill and craft standards rather than of speed. The material will be prepared by the candidate prior to the day of the test. The following joints may be included:

Through and stopped housing, bridle, halving, mortice and tenon (through, stopped, plain and haunched but not long and short shoulder), common dove-tail with not more than three sturdy pins, lap dovetail.

Simple shaping and chamfering from fully detailed drawings may be included.

THEORY PAPER

Section A will contain 15 compulsory short questions to test basic principles.

Section B will require three longer questions to be answered from the six set. Answers should be in note and sketch rather than "essay" form.

Approximately half the marks for this paper will be allocated to each section.

1. **TIMBER.** Questions will be worded so as to leave to the candidate the choice of hardwood and softwood and pests discussed. He will be expected to know the British standard name, characteristics and suitability for practical purposes, also to have a simple general knowledge of conversion (including veneer), seasoning, storage, movement and defects. A knowledge of botanical theory is not expected.
2. **TOOLS.** Their use, adjustment and maintenance. Safety in the workshop. Questions will be based on the nature of the craft operations to be performed, the candidates being left to specify the actual tools to be used.
3. **CONSTRUCTION.** Frame, stool, box or carcass, edge jointing of boards; working procedures. (Secret dovetails will not be required.) Use of plywood, hardboard and heavier manufactured boards.
4. **FIXING.** Preparation and use of animal and synthetic glues (questions on specific glues will not be set). Nails and screws, size, gauge, clearance holes, concealment. Fixing butt hinges.
5. **FINISHING.** Cleaning up with plane, scraper and glasspaper. Filling and polishing using brush polish, oil and wax. Painting and preservation of outdoor woodwork. Care of brushes and part-used material.

APPENDIX A

CONSTITUTION OF THE EXAMINATIONS BOARD

1. NATURE OF THE BOARD

For the provision of examinations for the Certificate of Secondary Education there shall be established a regional examinations board for the Local Education Authorities of

Lancashire	Chester
Cheshire	Liverpool
Barrow-in-Furness	St. Helens
Birkenhead	Southport
Blackburn	Stockport
Blackpool	Wallasey
Bootle	Warrington
Burnley	Wigan
Bury	Isle of Man

to be known as the North Western Secondary School Examinations Board (hereinafter referred to as the Board): provided that if any alterations in the area shall be accepted by the Board the area shall be varied accordingly.

2. FUNCTIONS OF THE BOARD

The functions of the Board shall be:

- (i) to offer external examinations on syllabuses and examination papers prepared by the Board, and to publish such syllabuses and specimen examination papers;
- (ii) to offer external examinations on syllabuses and examination papers proposed by individual schools, or groups of schools, and approved by the Board;
- (iii) to offer external assessment and validation of examinations conducted internally by individual schools, or groups of schools;
- (iv) to issue certificates to candidates judged successful in the examinations, such certificates to be known as the Certificate of Secondary Education and to be endorsed by an officer of the Ministry of Education* appointed for the purpose by the Minister*;
- (v) to determine the arrangements necessary for the proper conduct of the examinations for which it is responsible;
- (vi) to appoint such committees as it considers necessary and to delegate thereto power to act on its behalf in matters of management;
- (vii) to raise funds by examination fees and such other means as it shall from time to time determine.
- (viii) to initiate the formation of local advisory committees.

3. DUTIES OF THE BOARD

The duties of the Board shall include:

- (i) the appointment of a Secretary and determination of conditions of service;
- (ii) ensuring that the examinations for which it is responsible are suitable for the candidates who present themselves for such examinations;

Constitution

- (iii) ensuring that the standards of such examinations are reasonably comparable to those of the examinations conducted by other Regional Examining Bodies;
- (iv) ensuring that effective arrangements exist for the consideration of all representations received from schools, other educational establishments, candidates, local education authorities and other persons or bodies affected by, or concerned with, such examinations;
- (v) providing such information on all matters connected with the examinations as the Minister of Education or the Secondary School Examinations Council* may request; and
- (vi) ensuring that effective arrangements exist for the conduct of research and development.

4. GOVERNING COUNCIL

4 - 1 The Board shall be governed by a Council, which shall have the functions and duties described in sections 2 and 3. The Council shall consist of the following voting members:

- (i) a chairman to be appointed by the vote of other members of the Council but not necessarily to be appointed from amongst the representative members;
- (ii) 26 teachers serving in the schools principally affected by the examinations in the region, of whom 19 should be appointed on the nomination of the teachers' associations for the time being members of the Burnham Committee, and seven appointed from nominations from the subject panels;
(Nominations by the teachers' associations are to be as follows: National Union of Teachers, 8; Joint Four Association, 4; National Association of Schoolmasters, 3; National Association of Head Teachers, 2; Association of Teachers in Technical Institutions, 2.)
- (iii) ten representatives nominated by the Associated Authorities of Lancashire and Cheshire;
- (iv) three representatives of institutions of further education in the region to be nominated by the North Western Regional Advisory Council for Further Education;
- (v) one representative of each Institute of Education in the region;
- (vi) two representatives of industry and commerce in the region; and
- (vii) not more than six members to be co-opted by the Council, subject to the proviso that there shall always be a majority of teachers serving in the region in the membership of the Council.

In addition to the voting members the Council shall have the following assessors:

- (viii) one representative appointed by another Regional Examining Body;
- (ix) one of H.M. Inspectors of schools;
- (x) one local education authority inspector or adviser;
- (xi) one representative of the Youth Employment Service; and
- (xii) an officer of the Ministry of Education or the Secondary School Examinations Council to be appointed by the Minister or the Secondary School Examinations Council from time to time.

Constitution

4 - 2 Membership of the Council shall be for three years and one-third of the members shall retire each year except that in the interests of continuity the tenure of office of the members first appointed may be extended for one or two years. A retiring member may be reappointed either as a representative member or as a co-opted member.

5. EXAMINATIONS COMMITTEE

5 - 1 The Council shall appoint an Examinations Committee which shall have the following functions:

- (i) to make arrangements for the conduct of the examinations;
- (ii) to appoint examiners after considering the advice of the Subject Panels;
- (iii) to approve arrangements for the adoption of syllabuses submitted by the subject panels or otherwise;
- (iv) to ensure maintenance of standards appropriate to the subjects taken and to the candidates participating in the examinations;
- (v) to receive and to consider all representations on matters concerned with the examinations from schools and candidates participating and other persons and bodies affected or concerned; and
- (vi) to receive and to consider all appeals against decisions of Subject Panels, chief examiners, moderators, revisers and examiners.

5 - 2 The Examinations Committee shall consist of voting members as follows; provided that the Committee shall always have a majority of teachers serving in the schools principally concerned with the examinations within the region:

- (i) a chairman to be appointed by the Council but not necessarily to be appointed from amongst representative members of the Council;
- (ii) 26 serving teachers, of whom eight at least shall be members of the Council who are appointed on the nomination of the teachers' associations and 15 at least shall be members of Subject Panels;
- (iii) five representatives of local education authorities;
- (iv) two representatives of industry and commerce;
- (v) two representatives of further education;
- (vi) one representative from each Institute of Education in the region;
- (vii) not more than six members co-opted by the Committee and approved by the Council.

In addition to the voting members, a Regional Examinations Committee shall have the following assessors:

- (viii) one representative of another Regional Examining Board;
- (ix) one of H.M. Inspectors of schools;
- (x) one local education authority inspector or adviser.

5 - 3 Membership of the Examinations Committee shall be for three years and one-third of the membership shall retire each year except that in the interests of continuity the tenure of office of the first members may be extended for one or two years. A retiring member may be reappointed either as a representative member or as a co-opted member.

Constitution

6. FINANCE AND GENERAL PURPOSES COMMITTEE

6-1 The Council shall appoint a Finance and General Purposes Committee which shall have the following functions:

- (i) to determine the remuneration and conditions of service of the secretariat of the Board (excluding the Secretary) including examiners and revisers;
- (ii) to determine the fees to be charged to candidates, schools and groups of schools taking or participating in the examinations of the Board;
- (iii) to advise the Council on all other matters involving the income or expenditure of the Board, but excluding those specifically assigned to other Committees.

6-2 Membership of Regional Finance and General Purposes Committee.

The Finance and General Purposes Committee shall consist of voting members, selected from the members of the Council, as follows:

- (i) six representatives of local education authorities from among those nominated by the Associated Authorities of Lancashire and Cheshire;
- (ii) five other members of the Council, of whom at least three shall be serving teachers.

In addition to the voting members the Finance and General Purposes Committee shall have one assessor appointed by the Minister of Education.

6-3 Membership of the Finance and General Purposes Committee shall be for three years and one-third of the membership shall retire each year except that in the interests of continuity the tenure of office of the first members may be extended for one or two years. A retiring member may be reappointed.

7. SUBJECT PANELS

7-1 The Examinations Committee shall appoint a Subject Panel or Panels for each subject examined, except that the committee may, if they think fit, create panels to advise them on any combination of subjects.

7-2 Subject to the approval and authority of the Examinations Committee the functions of a Subject Panel shall, in relation to the subject with which it is concerned, be as follows:

- (i) to advise the Examinations Committee on all matters affecting the administration of the examinations;
- (ii) to prepare, scrutinise, or approve, as appropriate, examination syllabuses, examination papers, marking schemes and mark lists of candidates;
- (iii) to supervise the work of the chief examiners, examiners, revisers and moderators;
- (iv) to encourage, and to arrange, conferences with teachers of the subjects from the schools participating in the examinations;
- (v) to receive and consider all representations concerned with the work of the examiners and others on the examination syllabuses, papers, marking schemes, the marking of scripts and the preparation of mark lists.

Constitution

- 7 - 3 A Subject Panel shall consist of voting members as follows:
- (i) a chairman, to be appointed by the Examinations Committee, who shall not be the chief subject examiner, reviser or moderator.
 - (ii) a maximum of 15 (12, when more than one panel exists for a subject) serving teachers of the subject in the schools participating in the examination, to be appointed by the Examinations Committee from those nominated as follows: The secondary schools of the region shall be divided into groups and the serving teacher members of the Subject Panels shall represent and be elected by the subject teachers serving in the schools of their respective groups.
 - (iii) In addition the Panel may also co-opt non-voting members in order to provide expert knowledge or experience in the subject or in examination matters.

7 - 4 The voting members of a Subject Panel shall be appointed for three years and a third of the members shall retire each year, except that in the interests of continuity the tenure of service of the members first appointed may be extended for one or two years. A retiring member may be reappointed either as a representative member or as a co-opted member.

8. EXAMINATIONS

8 - 1 The external examinations of the Board shall be based upon syllabuses approved by the Subject Panels.

8 - 2 The Subject Panels shall take into account the views of the schools participating in the external examinations on the preparation of syllabuses and examination papers.

8 - 3 The Board shall arrange for an individual school or a group of schools acting in concert to submit and, if approved, operate schemes under which examination syllabuses, examination papers, marking schemes, course work assessment and mark lists are prepared and the examinations conducted within the school or schools, subject to approval, moderation, and inspection by the Board. In the event of a dispute with the Board, a school or a group of schools shall have the right of appeal to the Secondary School Examinations Council.

8 - 4 The Board shall ensure that the standards of the examinations conducted under paragraph 8 - 3 shall be reasonably comparable with the other examinations for which it is responsible, but this duty shall not be interpreted as requiring uniformity of content or method of examining as between the regional examination syllabuses and papers and those prepared by individual schools.

9. CERTIFICATES

9 - 1 The Board shall issue to successful candidates certificates in a form approved by the Secondary School Examinations Council.

9 - 2 The Certificates shall be known as the "Certificate of Secondary Education" and shall be signed by the Chairman and Secretary of the Council of the Board and by an officer on behalf of the Minister of Education, and shall be taken to represent the Board's responsibility for the arrangements for the maintenance of standards and the administration of the examination.

Constitution

The Board shall not introduce grades of marks for successful or unsuccessful candidates except with the approval of the Secondary School Examinations Council.

10. RIGHT OF REVIEW BY THE SECONDARY SCHOOL EXAMINATIONS COUNCIL AND THE MINISTER OF EDUCATION

10 - 1 The Board shall give access to all papers and accounts and shall permit attendance at all meetings of the Council, Examinations Committee and subject panels to officers of the Minister of Education, H.M. Inspectors, and officers of the Secondary School Examinations Council authorised for that purpose.

10 - 2 On appeal from a school, group of schools, a candidate or any other interested body or person, officers of the Minister of Education or of the Secondary School Examinations Council, may inspect or investigate the papers and activities of the Board.

11. ADMINISTRATION

11 - 1 Unless specifically approved by the Secondary School Examinations Council persons, other than teachers, who are employed by local education authorities within the region of the Board shall not be employed by the Board if they are to be wholly or mainly concerned with the administration of the school examinations in the area of the authorities by which they are employed.

12. AMENDMENT OF CONSTITUTION

12 - 1 The Constitution of the Board may be amended, subject to approval by the Secondary School Examinations Council, at any time by a resolution passed at a meeting of the Council at which not less than two months' notice in writing shall have been given to each member of the Council.

12 - 2 At the end of the first three years of operation the Board shall, in consideration of extended teacher participation, provide for the revision of the existing arrangements.

13. RECOGNITION BY THE MINISTER OF EDUCATION

The Board shall not offer any examinations unless recognised by the Minister of Education, who may attach to such recognition conditions relating to the following matters: the definition of the scope of the C.S.E. system; the definition of the standards of the examinations and their maintenance on a basis of reasonable comparability; the presentation of results; general rules for the admission of candidates; constitutional arrangements (including the area to be covered by the Board); national statistics and information.

Provided that the Minister shall act under this clause on the advice of the Secondary School Examinations Council.

Provided also that the Secondary School Examinations Council shall consult the Board before advising the Minister to grant, withhold or withdraw recognition, and shall in particular afford the Board an opportunity of commenting, before they are made binding, on any conditions which it is proposed to attach to such recognition.

* *The Ministry of Education is now the Department of Education and Science, the Minister of Education is now the Secretary of State for Education and Science, and the Secondary School Examinations Council is now the Schools Council.*

Appendix B

APPENDIX B

MEMBERS OF THE GOVERNING COUNCIL OF THE BOARD

(As at May 1, 1965)

Chairman: P. Lord, B.Sc., M.Ed.

Chief Education Officer, Lancashire.

NATIONAL UNION OF TEACHERS

E. Dennis, M.A., B.Sc.	Headmaster, Sutton County Sec. Boys' School, Ellesmere Port.
W. Donkersley, B.A.	Headmaster, Bailey Secondary Boys' School, Fleetwood.
S. W. Exworthy, J.P., M.A.	Headmaster, Our Lady of Lourdes Sec. Mod. School, Southport.
J. D. Jackson, B.Sc.	Headmaster, Ashton-on-Mersey Sec. Boys' School, Sale.
B. M. Jones	Brinnington Sec. Mod. School, Stockport.
W. J. Morton	Headmaster, Mansfield County Sec. School, Brierfield.
T. Potts, M.A.	County Grammar School for Boys, Crewe.
T. J. Rogers	Headmaster, Two Trees County Sec. School, Denton.

JOINT FOUR ASSOCIATION

Miss D. Ingram, J.P., B.A.	Headmistress, Holly Lodge High School, Liverpool.
J. Marsh, M.A.	Headmaster, Grammar School for Boys, Stretford.
Miss M. B. Thomas, B.Sc.	Arnold High School for Girls, Blackpool.
J. R. Thompson, M.A.	County Grammar School for Boys, Altrincham.

NATIONAL ASSOCIATION OF SCHOOLMASTERS

R. Jones	Brierley Street Sec. Boys' School, Crewe.
C. B. Nicholl	Headmaster, St. Anne's C.E. Sec. School, Royton.
W. K. Vaux, B.A.	Morrison Boys' Sec. School, Liverpool.

NATIONAL ASSOCIATION OF HEAD TEACHERS

C. W. Lawton, B.A.	Headmaster, St. George's C.E. Sec. School, Stockport.
T. Marsh, B.Sc.	Headmaster, Hulton County Sec. School.

ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTIONS

C. Escritt	Technical College and School of Art, Blackpool.
J. Kennedy	Stretford Technical College.

Appendix B

ASSOCIATED AUTHORITIES OF LANCASHIRE AND CHESHIRE

R. O. Beeston, M.A., B.Sc.	Director of Education, Burnley.
W. R. J. Coe, B.Sc.(Econ.)	Director of Education, Bootle.
Alderman G. F. Davies, J.P.	Chairman, Birkenhead Education Committee.
R. E. Hodd, B.Sc.(Econ.)	Chief Education Officer, Blackpool.
S. R. Hutton, B.Sc.	Chief Education Officer, Southport.
Dr. J. G. Kellett, M.Sc.	Director of Education, Cheshire.
P. Lord, B.Sc., M.Ed.	Chief Education Officer, Lancashire.
N. F. Newbury, M.A., M.Sc.	Director of Education, St. Helens.
H. M. Phillipson, M.A.	Chief Education Officer, Warrington.

REPRESENTATIVES OF INSTITUTES OF FURTHER EDUCATION

Alderman A. H. Shaw, M.A.	Bury Technical College.
C. J. Tirrell, M.B.E., B.Sc.	Principal, Crewe Central College of F.E.
N. Walker, B.Sc.(Eng.)	Principal, Stretford Technical College.

REPRESENTATIVES OF INSTITUTES OF EDUCATION

Dr. W. A. L. Blyth	University of Liverpool.
Professor S. Wiseman, B.Sc., M.Ed., Ph.D.	University of Manchester.

REPRESENTATIVES OF INDUSTRY AND COMMERCE

R. V. Cox	Transport and General Workers, Union, Salford.
D. D. Marshall	Greengate and Irwell Rubber Co. Ltd., Salford.

Assessors

REPRESENTATIVES OF ANOTHER REGIONAL EXAMINING BOARD

E. P. Iball,	Associated Lancashire Schools Examining Board.
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H.M. INSPECTOR OF SCHOOLS

W. M. White, H.M.I.

LOCAL EDUCATION AUTHORITY INSPECTOR OR ADVISER

C. H. W. Clarke, B.Sc. Adviser, Liverpool Education Authority.

YOUTH EMPLOYMENT SERVICE

I. H. Thomas Central Youth Employment Executive,
Manchester.

DEPARTMENT OF EDUCATION AND SCIENCE OR SCHOOLS COUNCIL

Dr. M. H. Johnes, M.A. Headmaster, Penley County Sec. School.

Appendix C

APPENDIX C

MEMBERS OF THE EXAMINATIONS COMMITTEE

(As at May 1, 1965)

Chairman: T. J. Rogers

Headmaster, Two Trees County Secondary School, Denton.

SERVING TEACHERS

MEMBERS OF THE COUNCIL

E. Dennis, M.A., B.Sc.	Headmaster, Sutton County Sec. Boys' School, Ellesmere Port.
W. Donkersley, B.A.	Headmaster, Bailey Sec. Boys' School, Fleetwood.
Miss D. Ingram, J.P., B.A.	Headmistress, Holly Lodge High School, Liverpool.
B. M. Jones	Brinnington Sec. Modern School, Stockport.
R. Jones	Brierley Street Sec. Boys' School, Crewe.
J. Kennedy	Stretford Technical College.
C. W. Lawton, B.A.	Headmaster, St. George's C.E. Sec. School, Stockport.
C. B. Nicholl	Headmaster, St. Anne's C.E. Sec. School, Royton.
T. Potts, M.A.	County Grammar School for Boys, Crewe.
Miss M. B. Thomas, B.Sc.	Arnold High School for Girls, Blackpool.
J. R. Thompson, M.A.	County Grammar School for Boys, Altrincham.

MEMBERS OF SUBJECT PANELS

A. S. Corrin	Warwick Bolam County Sec. School, Bootle.
J. Crabtree	Ramsbottom County Secondary School.
Mrs. M. de Mierre, Mus.B.	Fairfield High School for Girls, Droylsden.
B. F. Grant	Knutsford County Secondary School.
R. Hopwood, B.A.	Ruffwood Comprehensive School, Kirkby.
R. G. Hough	Wellfield County Sec. School, Leyland.
E. Lees	Wilmslow Grammar School.
W. B. Martin	Fred Longworth County Sec. School, Tyldesley.
B. E. Oldham	Egerton Park County Sec. School, Denton.
A. E. Prince	Hough County Sec. Boys' School, Wilmslow.
G. O. Sanderson, B.A.	Penwortham County Secondary School.
W. Shambrook, B.D.	Verdin County Grammar School, Winsford.
J. A. G. Thomas, B.Sc.	Verdin County Grammar School, Winsford.
Miss M. S. Thomas	Fulwood County Secondary School.
H. G. Whitehead	Christ Church Secondary School, Southport.

Appendix C

REPRESENTATIVES OF LOCAL EDUCATION AUTHORITIES

- R. O. Beeston, M.A., B.Sc. Director of Education, Burnley.
R. E. Hodd, B.Sc.(Econ.) Chief Education Officer, Blackpool.
S. R. Hutton, B.Sc. Chief Education Officer, Southport.
P. Lord, B.Sc., M.Ed. Chief Education Officer, Lancashire.
N. F. Newbury, M.A., M.Sc. Director of Education, St. Helens.

REPRESENTATIVES OF INDUSTRY AND COMMERCE

- R. V. Cox Transport and General Workers Union,
Salford.
D. D. Marshall Greengate and Irwell Rubber Co. Ltd.
Salford.

REPRESENTATIVES OF FURTHER EDUCATION

- C. J. Tirrell, M.B.E., B.Sc. Principal, Crewe Central College of F.E.
N. Walker, B.Sc.(Eng.) Principal, Stretford Technical College.

REPRESENTATIVES OF INSTITUTES OF EDUCATION

- J. D. Carsley, M.A. University of Liverpool.
Professor S. Wiseman, B.Sc., M.Ed., Ph.D. University of Manchester.

CO-OPTED MEMBER

- Dr. J. G. Kellett, M.Sc. Director of Education, Cheshire.

Assessors

REPRESENTATIVE OF ANOTHER REGIONAL EXAMINING BOARD

- E. P. Iball Associated Lancashire Schools Examining
Board.

H.M. INSPECTOR OF SCHOOLS

- W. M. White, H.M.I.

LOCAL EDUCATION AUTHORITY INSPECTOR OR ADVISER

- C. H. W. Clarke, B.Sc. Adviser, Liverpool Education Authority.

Appendix D

APPENDIX D

**MEMBERS OF THE FINANCE AND GENERAL PURPOSES
COMMITTEE**

(As at May 1, 1965)

Chairman: Alderman G. F. Davies, J.P.

Chairman, Birkenhead Education Committee.

REPRESENTATIVES OF LOCAL EDUCATION AUTHORITIES

Alderman G. F. Davies, J.P.	Chairman, Birkenhead Education Committee.
Dr. J. G. Kellett, M.Sc.	Director of Education, Cheshire.
P. Lord, B.Sc., M.Ed.	Chief Education Officer, Lancashire.
H. M. Phillipson, M.A.	Chief Education Officer, Warrington.

OTHER MEMBERS OF THE GOVERNING COUNCIL

J. Marsh, M.A.	Headmaster, Stretford Grammar School.
W. J. Morton	Headmaster, Mansfield County Sec. School, Brierfield.
W. K. Vaux, B.A.	Morrison Boys' Secondary School, Liverpool.

ASSESSOR APPOINTED BY THE DEPARTMENT OF EDUCATION AND SCIENCE

D. L. Corder

CO-OPTED MEMBER

T. J. Rogers	Headmaster, Two Trees County Sec. School, Denton.
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Appendix E

APPENDIX E

CHAIRMEN OF SUBJECT PANELS

(As at May 1, 1965)

ARITHMETIC

Miss M. B. Thomas, B.Sc. Arnold High School for Girls, Blackpool.

ART AND CRAFT

K. D. Morris, A.T.D. Organiser (Art), Lancashire Education Authority.

BIOLOGY

E. Dennis, M.A., B.Sc. Headmaster, Sutton County Sec. Boys' School, Ellesmere Port.

BUILDING GEOMETRY AND DRAWING

Vacant

CHEMISTRY

N. F. Newbury, M.A., M.Sc. Director of Education, St. Helens.

COMMERCE

J. A. Holt, B.A.(Admin.) St. George's C.E. Sec. School, Stockport.

DOMESTIC SCIENCE

Miss C. M. Rhind Organiser (Domestic Subjects), Cheshire Education Authority.

ENGINEERING SCIENCE

A. Rose, B.Sc. Headmaster, Tyldesley County Sec. School, Blackpool.

ENGINEERING WORKSHOP THEORY AND PRACTICE

N. Walker, B.Sc.(Eng.) Principal, Stretford Technical College.

ENGLISH LANGUAGE

Vacant

ENGLISH LITERATURE

W. Donkersley, B.A. Headmaster, Bailey Sec. Boys' School, Fleetwood.

FRENCH

Miss D. Ingram, J.P., B.A. Headmistress, Holly Lodge High School, Liverpool.

Appendix E

GEOGRAPHY	
R. Jones	Brierley Street Sec. Boys' School, Crewe.
GEOLOGY	
C. W. Lawton, B.A.	Headmaster, St. George's C.E. Sec. School, Stockport.
GEOMETRICAL AND ENGINEERING DRAWING	
J. A. Hallworth	Wellington Boys' County Sec. School, Altrincham.
GERMAN	
T. Potts, M.A.	County Grammar School for Boys, Crewe.
GOVERNMENT AND CITIZENSHIP	
R. Birkett, B.A.	Headmaster, Beamont Sec. Tech. School, Warrington.
HEALTH EDUCATION	
Miss J. A. Mastin	Headmistress, Bredbury Sec. Girls' School.
HISTORY.	
R. S. Paul, M.A.	Queen Elizabeth's Grammar School, Middleton.
MATHEMATICS	
A. D. Walters, M.A.	Principal Lecturer, Padgate Training College.
METALWORK	
E. Lees	Wilmslow Grammar School.
MUSIC	
Miss J. M. Paterson	Organiser (Music), Lancashire Education Authority.
NEEDLEWORK	
Miss P. Sharples	Organiser (Domestic Subjects), Lancashire Education Authority.
PHYSICS	
W. E. W. Smith, M.A.	Caldy Grange Grammar School, West Kirby.
PRINCIPLES OF ACCOUNTS	
Vacant	
RELIGIOUS KNOWLEDGE	
B. M. Jones	Brinnington Secondary School, Stockport.

Appendix E

RURAL STUDIES

R. Simpson, M.B.E., B.Sc. Headmaster, Carr Hill Sec. School, Kirkham.

SCIENCE

H. H. Christian, B.Sc. Headmaster, Weaverham County Sec. School.

SHORTHAND

A. Stubbs Crewe Central College of F.E.

SPANISH

W. G. Brereton, M.A. Ellergreen High School, Liverpool.

TYPEWRITING

C. Escritt Technical College and School of Art,
Blackpool.

WOODWORK

A. S. Corrin, Warwick Bolam County Sec. School, Bootle.

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