BLOCK LAYING, BRICK LAYING AND CONCRETE WORKS

EXAMINATION SCHEME

There will be three papers, Papers 1, 2 and 3 all of which must be taken.Papers 1 and 2 shall be a composite paper to be taken at one sitting in 1 hour 45 minutes for 100 marks.

Paper 1: will consist of forty multiple-choice objective questions all of which are to be answered in 45 minutes for 40 marks.

Paper 2: will consist of five short-structured questions. Candidates will be required to answer any four in 1 hour for 60 marks.

Paper 3 will be a practical test of 3 hours duration for 100 marks. It will be a work piece involving laying of a total number of blocks not exceeding 30 and where the work piece is made of bricks only, the total number of bricks shall not exceed 100.

Where the work piece to be laid is a combination of bricks and blocks, this will not contain more than 20 blocks and 40 bricks. (i.e. in composite walling).

A list of materials for the test shall be made available to schools not less than two weeks before the paper is taken for material procurement and relevant preparations.

Alternative to Practical Test

Alternatively, in the event that materials for the actual practical test cannot be acquired, the Council may consider testing theoretically, candidates' level of acquisition of the practical skills prescribed in the syllabus. For this alternative test, there will be two compulsory questions to be answered in 3 hours for 100 marks.

DETAILED SYLLABUS

S/NO.	CONTENT	NOTES
1.	Workshop and site safety	(i) Various safety rules at work site. (ii) First aids. (iii) Purpose of safety. (iv) Safety regulations (scaffolding, electrical, installations, etc) (v) Protective wears.

2	Basic tools and equipment	(i) (ii) (iii) (iv)	Identification of basic hand tools for blocklaying, bricklaying and concreting including site preparation and levelling tools, finishing tools. Sketching of basic hand tools. Uses of basic hand tools and equipment. Simple maintenance of basic tools and equipment.
3	Site preparations and setting - out	(i) (ii) (iii) (iv)	Tools and equipment used for site preparation. Clearing of building site. Methods of setting out. Setting out tools and materials.
4.	Manufacture, application and properties of blocks and bricks.	(i) (ii) (iii)	Manufacturing processes of blocks and bricks. Types of bricks and blocks Materials used for blocks and bricks (sand, lime, cement, clay, laterite and water).
5.	Concreting materials	(i) (ii) (iii) (iv)	Various constituents of concrete Cement – Types of cement Definition of Fine and coarse aggregates and their differences. Storage of concrete materials.
6	Formwork for construction work.	(i) (ii) (iii) (iv) (v)	Functions and functional requirements of formwork. Materials used for formwork. Advantages of steel and timber formworks. Construction of formworks for concrete floor slabs, beams, columns, arches lintels and staircase. Erection and striking of formworks.
S/NO.	**CONTENT**	**NOTES**	
7	Concreting operations	(i) (ii) (iii) (iv) (v) (vi)	Mix proportions. (Cement - aggregate ratio; water-cement ratio). Stages in concreting (Batching, mixing, transporting, placing, curing). Methods of transporting wet concrete. Testing of concrete. Properties of concrete. Methods of making construction joints in

		concrete elements. (Beams, columns, concrete roofs and slab). (vii) Need for concrete reinforcement. (viii) Methods of reinforcing concrete elements (ix) Types of steel reinforcement bars. (x) Casting and curing of concrete structures (in-situ and precast concrete).
8	Basic principles of substructure construction work including ground floors	(i) Types of soil. (ii) Definitions of site and soil investigation. (iii) Definitions of bearing capacity of soil. (iv) Definition of foundation, types and uses. (v) Definitions of ground floors, types, uses and construction. (vi) Materials for d.p.c. and d.p.m. (vii) Differences between d.p.c. and d.p.m. (viii) Methods of placing and positioning d.p.c. in walls.
9	Upper floors	(i) Functions and types of floors. (ii) Methods of floor construction. (iii) Types of flooring and their applications.
10	Walls	(i) Functions and types of walls. (ii) Walling materials. (iii) Common bonds in brick/block walls. (iv) Mortar (types, mixing methods and ratios). (v) Differences between pointing and jointing. (vi) Types of pointing and jointing.
S/NO.	**CONTENT**	**NOTES**

11	Openings in walls.	(i) (ii) (iii) (iv)	Functions and types of openings. Materials used for lintels, beams, and arches Windows and doors - functions and types of windows and doors. - materials for windows and doors. - methods of fixing. Ironmongery for doors and windows.
12	Stairs construction	(i) (ii)	Types of stair. Construction of a straight flight stair.
13	Scaffold and scaffolding	(i) (ii) (iii) (iv)	Types of scaffolds. Scaffold components. Hoisting equipment. Safety regulation.
14	Finishes	(i) (ii) (iii) (iv) (v)	Types of finishes. Types of finishing materials. Characteristics of finishing materials. Uses of finishing materials Care and maintenance of finishes.
15	Construction of drainage system.	(i) (ii) (iii) (iv) (v) (vi)	Principles of good drainage system. Types of a drainage system. Differences between a sewer and a drain. Simple sketches of septic-tank; soakaway pit, inspection chamber, manhole and cesspool. Surface drainage. Method of laying drain pipes to a specified gradient.
16	Kerbs	(i) (ii) (iii)	Functions and types of kerbs. Materials used in production of kerbs. Methods of laying precast concrete kerbs.
17	Business opportunities in Building	(i) (ii) (iii) (iv) (v)	Opportunities in building industry. Procedures for establishing businesses in the industry. Requirements for managing construction business Estimating the cost of construction jobs. Principles and techniques of Book-keeping.

LIST OF TOOLS AND EQUIPMENT

TOOLS

1. Internal angle trowel
2. External angle trowels
3. Pointing trowel
4. Hand trowel
5. Block axe
6. Boat level
7. Bolster
8. Club hammer
9. Builders square
10. Brick hammer
11. Cold chisel
12. Corner blocks
13. Folding rule
14. Gauge rod or rule
15. Hawk
16. Joint duster
17. Jointers
18. Jointing board/caulking board
19. Line and pin
20. Mason's hand saw
21. Metal float
22. Plastering trowel
23. Plumb rule and bob
24. Builder's line
25. Spade
26. Shovel
27. Claw hammer
28. Gauge lath
29. Pointing tools
30. Pointing trowel
31. Range.
32. Spirit level.
33. Steel square
34. Straight edge
35. Skutch

EQUIPMENT

1. A complete set of scaffolding, fittings and scaffolding pipes
2. Block moulding machines
3. Buckets
4. Concrete mixer
5. Concrete vibrator (Poker and clamp-on)
6. Gauge box
7. Manual hand mould
8. Hand rammer
9. Hand sieves (various sizes)
10. Headpan
11. Levelling instrument
12. Measuring tape
13. Pick axe
14. Slump test apparatus.
15. Tyrolean machine
16. Water hoses and roses
17. Wheelbarrow.
18. Terrazzo grinding machine

36. Square and bevel
37. Tingle plate
38. Wire brush
39. Wooden float.

SUGGESTED READING LIST

S/NO.	TITLE OF BOOK	AUTHOR	PUBLISHER
1	Barry's introduction to construction of Buildings	Stephen Emmett and Christopher A Gorse	Blackwell Publishing.
2	Building Technology	Ivor H. Seeley	Palgrave
3	Building Construction, Volumes 1 – 4	Mckay	Longman
4	Principles of construction	Roger Greeno.	
5	Advanced Building Construction Volumes 1 & 2	C. M. H. Baritt.	Longman
6	Construction Technology Volumes 1 – 4	R. Chudley.	Longman
7	Building Construction for Senior Secondary Schools. Volumes 1 – 3	L. A. Adesokan and M. O. Adeniyi.	Ilesanmi
8	Blocklaying and concreting Industrial Crafts Series	M. O. Obande	Longman
9	Brickwork Volume 1 – 3	W. G. Nash	