

BLOCK LAYING, BRICK LAYING AND CONCRETING

STRUCTURE AND SCHEME OF THE EXAMINATION

The Examination shall consist of three (3) papers, all of which must be taken.

Paper 1 shall consist of forty (40) multiple choice questions for 40 marks and shall last for 45 minutes.

Paper 2 shall be an essay paper consisting of 5 short structured questions, 4 of which should be answered in 1 hour for 60 marks.

Paper 1 and 2 shall be a composite paper 1 hour 45 minutes duration for 100 marks.

Paper 3 (Practical) shall be of 3 hour duration for 100 marks. This shall be a work piece involving laying of 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.

When is a combination of bricks and blocks, this shall not contain more than 20 blocks and 40 bricks. (i.e. in composite walling). Council may consider testing candidates using the alternative to practical (in lieu of real practical) in the event of constraints of requisite facilities. In that case, the paper shall be a test of knowledge of practical processes, techniques in blocklaying, bricklaying and concrete work as well as safe practices in the workshop.

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) Identification of basic hand tools for blocklaying, bricklaying and concreting including site preparation and levelling tools, finishing tools. (ii) Sketching of basic hand tools. (iii) Uses of basic hand tools and equipment.

		(iv) Simple maintenance of basic tools and equipment.
3	Site preparations and setting - out	(i) Tools and equipment used for site preparation. (ii) Clearing of building site. (iii) Methods of setting out. (iv) Setting out tools and materials.
4.	Manufacture, application and properties of blocks and bricks.	(i) Manufacturing processes of blocks and bricks. (ii) Types of bricks and blocks (iii) Materials used for blocks and bricks (sand, lime, cement, clay, laterite and water).
5.	Concreting materials	(i) Various constituents of concrete (ii) Cement – Types of cement (iii) Definition of Fine and coarse aggregates and their differences. (iv) Storage of concrete materials.
6	Formwork for construction work.	(i) Functions and functional requirements of formwork. (ii) Materials used for formwork. (iii) Advantages of steel and timber formworks. (iv) Construction of formworks for concrete floor slabs, beams, columns, arches lintels and staircase. (v) Erection and striking of formworks.
S/NO.	CONTENT	NOTES
7	Concreting operations	(i) Mix proportions. (Cement - aggregate ratio; water-cement ratio). (ii) Stages in concreting (Batching, mixing, transporting, placing, curing). (iii) Methods of transporting wet concrete. (iv) Testing of concrete. (v) Properties of concrete. (vi) 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	<ul style="list-style-type: none"> (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	<ul style="list-style-type: none"> (i) Functions and types of floors. (ii) Methods of floor construction. (iii) Types of flooring and their applications.
10	Walls	<ul style="list-style-type: none"> (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.	<ul style="list-style-type: none"> (i) Functions and types of openings. (ii) Materials used for lintels, beams, and arches (iii) Windows and doors <ul style="list-style-type: none"> - functions and types of windows and doors. - materials for windows and doors. - methods of fixing. (iv) Ironmongery for doors and windows.
12	Stairs construction	<ul style="list-style-type: none"> (i) Types of stair. (ii) Construction of a straight flight stair.
13	Scaffold and scaffolding	<ul style="list-style-type: none"> (i) Types of scaffolds. (ii) Scaffold components. (iii) Hoisting equipment. (iv) Safety regulation.
14	Finishes	<ul style="list-style-type: none"> (i) Types of finishes.

		(ii) Types of finishing materials. (iii) Characteristics of finishing materials. (iv) Uses of finishing materials (v) Care and maintenance of finishes.
15	Construction of drainage system.	(i) Principles of good drainage system. (ii) Types of a drainage system. (iii) Differences between a sewer and a drain. (iv) Simple sketches of septic-tank; soakaway pit, inspection chamber, manhole and cesspool. (v) Surface drainage. (vi) Method of laying drain pipes to a specified gradient.
16	Kerbs	(i) Functions and types of kerbs. (ii) Materials used in production of kerbs. (iii) Methods of laying precast concrete kerbs.
17	Business opportunities in Building	(i) Opportunities in building industry. (ii) Procedures for establishing businesses in the industry. (iii) Requirements for managing construction business (iv) Estimating the cost of construction jobs. (v) 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

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

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

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	