OBJECTIVES

The examination will be limited in scope to buildings of up to two floors (i.e. ground and first floor) and will

(a) test candidates' ability to understand the process and the use of materials, including local materials, tools, and equipment for construction;

(b) test candidates' ability to observe safety precautions and safe practices where applicable;

(c) allow candidates to prepare for further studies in the construction or allied professions.

SCHEME OF EXAMINATION

The Examination shall consist of two (2) Papers, **both** of which must be taken.

Paper 1: 2 ½ hours duration for 100 marks.

Section A: (Not available to candidates in Ghana)

This shall be a paper in BUILDING DRAWING and shall consist of 4 questions. Candidates shall be required to respond to **1 compulsory question** and any **2 other questions.** The compulsory question shall carry 40 marks. The 3 other questions shall carry 30 marks each.

Section B: (Not available to candidates in Nigeria)

This shall be a written paper and shall consist of **6 questions** out of which candidates shall be expected to respond to **4 questions. One question** shall be **compulsory** and shall carry 40 marks. The 5 other questions shall carry 20 marks each.

Paper 2: 1 ¾ hours duration for 100 marks.

This shall consist of 2 sections: A and B. Section A will be composed of 40 multiple choice questions for 40 marks and shall last for 45 minutes. Candidates, even if they finish Section A before the 45 minutes elapse, may not start work on Section B until the Supervisor specifically so instructs.
Section B will be composed of **5** short answer questions, **4** of which should be answered in 1 hour for 60 marks.

DETAILED SYLLABUS

CONTENTS	NOTES
1. Types of Building Domestic Buildings - homes Public buildings - schools hospitals offices churches sanitary buildings, mosques	Classifications, uses, safety requirements.
2. Construction team	Simple definition of the role, duties and relationship of the following in a building project. (i) Contractor's team – builder/site engineer/project agent, contracts manager, general foreman, gang-leader, tradesmen/craftsmen (mason, carpenter, welder, plumber, painter, iron bender, brick layer), time-keeper, gateman/watchman (ii) Client's team – client, architect, engineer, clerk of works, quantity surveyor, land surveyor. (iii) Statutory personnel – building inspector, town planner, public health inspector, inspector of factories Explain the consequences of not having building plans approved in accordance with rules and regulations.
3. Building Drawing	Use of drawing tools, simple exercises in plane geometry in relation to building. Building drawing symbols:- materials and components. Scales used in building and their application on site. Drawing of simple building plans, elevations, (front, rear, sides), sectional views. Freehand sketches of pictorial views and details of buildings. Drawing of special details – (enlarged).

CONTENTS	NOTES
4. Working Drawings and other Documents	Site plan, block plan, foundation drawings, elevations, plans, sections, basic symbols, specifications. Bills of Quantities – (main features and use of) Material schedule – steel reinforcement, timber.
5. Site layout and preparation	Site boundary lines, access roads, temporary structures, site services, site clearing and levelling, tools and equipment. Simple surveying. Preliminary operations needed for commencement of work on site. Extermination of termites.
6. Setting out	Methods of setting out – using surveying instruments, triangulation, builders' square. Tools and equipment for setting-out. Setting-out of a simple building-tools, procedure, accuracy in measurements, local building regulations. Timber profiling and marking-out. (Only setting-out at right angles on flat or gentle slopes is required).
7. Substructure Works (1) Excavation and earthwork	Excavation of foundation trenches and pits. Temporary supports to sides of excavation. Levelling and preparing the bottoms of excavations. Types and uses of mechanical plant-dragline, faceshovel, backactor, bulldozer, skimmer. Soil classification – clay, sand, made-up soil, gravel, rock, laterite.
(2) Foundations	Types and functions. Choice of foundation type (nature and type of soil; type of structure). Size and depth of foundation for load-bearing walls, isolated columns and piers.
(3) Substructure walls	Types, function and materials, bonding. Mortars for substructure works and their composition.
(4) Damage protection to substructure works	Protection of substructure works against damage; including damp protection.
(5) Ground floors	Functions, types - solid, timber and suspended ground floors. Materials, composition and construction (including levelling). Finishings. Hardcore filling. Damp prevention.

CONTENTS	NOTES
8. Superstructure	Types and functions of internal and external walls. Load bearing and non-load bearing walls.
(1) Walls	Manufacture of walling materials and mortars. - sandcrete block - burnt brick - landcrete block - clay/mud/lateritic block (e.g. adobe, wattle and daub). - weatherboarding Methods of constructing walls. Damp prevention. Termite exclusion. Parapet walls and coping. Throating. Party walls, fence walls, balustrades and balustrading.
(2) Suspended floors	Solid reinforced concrete floors. Timber floors. Supporting beams and columns-functions, materials and construction. (Ceilings – functions, materials and construction). Corridors, balconies – uses and safety requirements.
(3) Doors and windows	Openings in walls. Types and uses of, functions, materials for, and parts of doors, windows, frames and lintels. Fixing of frames, doors and windows to brickwork, blockwork and concrete (including ironmongery). Insect and water exclusion, burglary proofing. Protection against moisture penetration.
(4) Roofs	Types, functions and construction in timber and metals including lean-to, pitched and flat roofs. Parts of roofs. Coverings-clay and concrete tiles, corrugated (asbestos, galvanized metal and aluminium) sheets, bamboo, wood and raffia shingles and other local materials. Roof drainage in metal, concrete and bamboo gutters; down pipes. Parapets-uses and safety requirements.
9. Staircases	Classifications, uses, safety requirements. Types: straight flight, quarter-turn, half-turn or dog-leg, spiral. Parts of stairs. Construction of timber, metal and concrete staircases. Advantages and disadvantages of various materials. Detailing of staircases.

CONTENTS	NOTES
10. Building Services	
(1) Drainage – Rain and Waste water.	Principles – laying, testing, inspection and cleaning, ventilation of drains. Protection against flooding.
(2) Plumbing – Water Supply and Sewerage	Materials, fittings and installation. Septic tank, manhole and soakaway construction. Water reservoirs-types and materials.
(3) Electrical installation	Representative techniques. Materials. Types of wiring. Safety precautions.
11. Finishes	Wall and floor finishes. Types of finishes-rendering and plastering, tyrolean, polished and washed terrazzo, wall and floor tiles, paints and painting. Purpose of finishing.
12. Building and Construction materials	Fundamental properties, uses and hazards of timber, stone, soil, cement, crushed stone, sands, steel, aluminium, glass, asbestos-cement. Conversion, seasoning and preservation of timber. Stabilization of soil. Prevention of rust. Chemistry of cement, including hydration products in the hardening process. Crack prevention.
13. Concrete works	Constituents of concrete. Batching of concrete materials. Mixing, placing and curing of concrete. Concrete mixes. Slump, compacting factor and strength tests of concrete. Reinforcement. (Portland cement concrete only). Formwork-types, uses and construction of timber formwork for columns, lintels, beams and slabs.
14. Safe Practices	Safety equipment and measures at construction sites including fire fighting appliances e.g. hydrants and fire alarm. First aid equipment and procedures.

LIST OF TOOLS AND EQUIPMENT REQUIRED FOR WASSCE BUILDING CONSTRUCTION

1. Measuring tape
2. Builder's line
3. Club hammer
4. Builder's square
5. Optical square
6. Handsaw
7. Spirit level
8. Claw hammer
9. Pick-axe
10. Shovel
11. Spade
12. Headpan
13. Bucket
14. Wheel-barrow
15. Straight edge
16. Concrete mixer
17. Trowel (pointing, laying and plastering)
18. Lines and pins
19. Float
20. Water hose
21. Folding rule
22. Rollers and brushes
23. Scrapers
24. Wrench
25. Diecing machine
26. Hacksaw
27. Screwdriver/tester
28. Insulated pliers
29. Multimeter (Avometer)
30. Tools normally required in Woodworking shop
31. Tyrolean machine
32. Plumb bob
33. Hand rammer

RECOMMENDED TEXTBOOKS

1.	Building Construction, Volumes 1-4 (Longman)	-	by W.B. Mckay
2.	Building Construction (Longman)	-	by S.C.O.A. Ezeji
3.	Principles of Construction	-	by Roger Greeno
4.	Advanced Building Construction Volumes 1 and 2 (Longman)	-	by C.M.H. Barritt
5.	Construction Technology, Volumes 1-4 (Longman)	-	by R. Chudley
6.	Building Construction for Senior Secondary Schools. Volumes 1-3 (Ilesanmi)	-	by L.A. Adesokan and M.O. Adeniyi
7.	Construction of Building Volumes 1-4	-	by R. Barry