

**CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)**



FORM FOUR PRE – NATIONAL EXAMINATION AUG 2025

**BUILDING CONSTRUCTION (THEORY)
MARKING SCHEME**

1. 10 MARKS (@ 1 Marks).

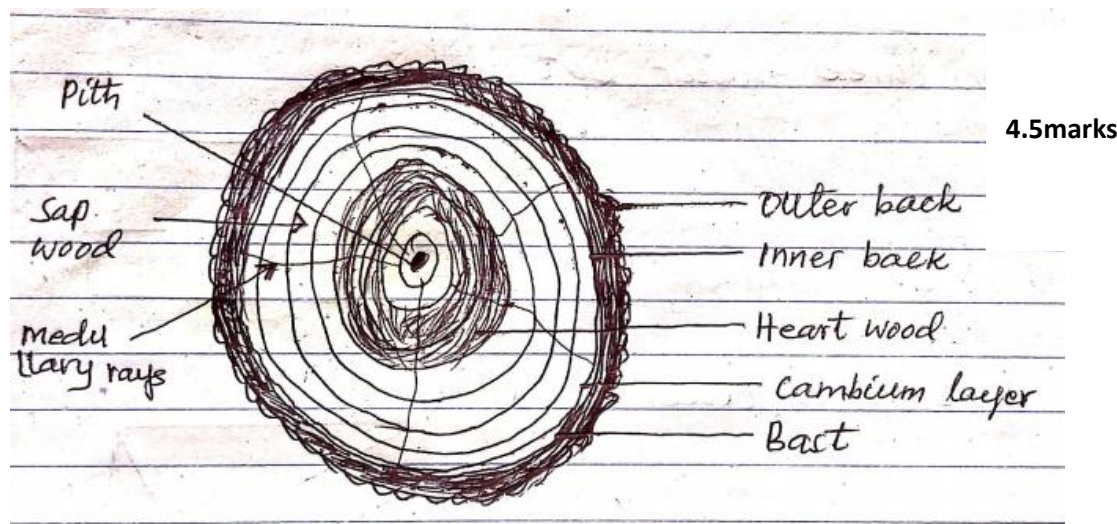
i	ii	iii	iv	v	vi	vii	viii	ix	x
B	C	A	C	C	C	A	B	A	D

2. 6marks

LIST A	I	II	III	IV	V	VI
LIST B	A	C	I	D	G	N

SECTION B 54 Marks

3. A)



B) (i) Through and through method

ii) Tangential method

iii) Quarter sawing method

1.5 Marks each one

4. A) Pointing or jointing (4.5marks)

B) i) Weather struck joint

ii) Struck joint

iii) Recessed joint

iv) Tuck pointing

v) Flush joint

vi) Protruding joint

(4.5marks)

vii) Tooled joint

viii) Keyed or grooved pointing

ix) "v" joint

x) Bedded joint

xi) Racked joint

xii) Convex joint

5. A. Is to carry the concentrated loads and transmit to sub soil safely

(3marks)

B) i) Deep foundations

ii) Shallow foundations

(3marks)

C) Scaffolding is a temporary support used by the builders to reach their work if the length of the work exceeds the height of the builder

(3marks)

WHILE

Shoring is the temporary structure which is used to support unsafe structures in the case of demolition or repair.

6. a) Three methods of dewatering are; 3marks

-Dewatering by horizontal method: This is relatively simple to implement. A pump is connected to the drain once the drainpipe is installed. The anticipated construction can begin after the water table level has been lowered.

-Dewatering by well points: Well points are often put in a line along or around the perimeter of the excavation at close intervals. The height to which water can be dragged is limited to around 6m since a vacuum is confined to zero bar.

-Dewatering by deep wells: Deep excavation is required when a substantial amount of ground water must be excavated. Here dewatering is accomplished by drilling deep wells in soil or rocks with permeability ranging from moderate to high.

-Dewatering by buckets: This is the simplest method of dewatering through the use of buckets. Buckets are used to fetch water and remove the water from the trench, which is then poured far away from the trench.

-Dewatering by sump/drain pumping: It is a method of pumping water from a region in the ground where water has been collected.

b) Three qualities of foundations are; 3marks

- A foundation should allow the structure to settle evenly on it.

- It should convey the buildings weight to a stable sub-soil.
- It should support the building load for the duration of its life span.

c) Three methods of bridging opening

- The use of lintels is the common one for the shorter openings. The lintels need to be stable and strong. It must provide or extend 150mm on each end of the opening.

- Beams are used for longer span openings. The beam needs to be stable and strong. 3marks
- Arches are used for circular, flat or camber arches. The arches need to be stable and strong.

7. a) (i) -Support the load of the structure and transfer it safely to the ground

- Distribute loads evenly to prevent differential settlement
- Provide stability against lateral forces such as wind or earthquakes 4.5marks
- Prevent structure movement due to ground moisture changes

(ii) -Poor soil conditions

- Inadequate depth of foundation 4.5 marks
- Improper design
- Use of substandard construction materials
- Drainage issues
- Overloading beyond the foundation's capacity

8. a) (i) Five properties of green concrete 3marks

-Workability of fresh concrete: The workability of concrete refers to how easy or difficult is to handle, transport and place concrete. The amount of water should be in the right proportion.

-Concrete compaction: Concrete compaction entails releasing trapped air from the concrete. The air became trapped in the concrete during pouring process.

-Consistency: The degree of plasticity or texture of cement concrete is defined as consistency. It refers to the relative flow ability of freshly mixed concrete or mortar.

-Segregation of fresh concrete: The. separation of the constituent materials of concrete is known as segregation.

-Stability: refers to the ability of the concrete to remain stable, homogeneous and coherent mass without segregation during handling and vibrations.

-Mobility of fresh concrete

-Bleeding

(ii) Five importance's concrete curing

- Durability improvement
- Minimizes shrinkage cracks
- Ensures proper bonding
- Prevents dusting
- Reduces permeability 3marks
- Strength development
- Improves surface hardness

b)-To prevent weak concrete

- To ensure proper bonding
- To prevent long time deterioration 3marks
- To maintain uniformity in the mix
- To avoid chemical reactions
- To avoid delayed setting and hardening

SECTION C 30MARKS

9. (3 marks each romans)

- i) Architect-Is responsible for design of structure and structure is constructed with owners' specification and advices the client
- ii) Quantity surveyor –Is the one who prepare bills of quantity and all cost of the project
- iii) Clark of work – Is the client's representative on site
- iv) Apprentice – Is the one who attending the site work for the purpose of learning the basic construction skill in particular trade
- v) General foreman – Is the in charge of all site construction works under technician

10. A) Is the arrangement of bricks or blocks in to particular patterns in order to avoid vertical straight joint (5marks)

B. (2.5 marks each romans)

- i) To carry the above loads to the equal area without causing depression or settlement
- ii) To strengthen the wall when well fabricated to prevent overturning

C) (0.5 marks) each roman

- i) Stretcher bond
- ii) Header bond
- iii) Flemish bond
- iv) English bond
- v) Dutch bond
- vi) Murk bond

- vii) Rat trap bond
- viii) Brick on edge bond
- ix) English garden wall bond
- x. Flemish garden wall bond

11. a) **Formwork** refers to the structure used as temporary mold into which concrete can be poured and molded WHILE **Centering** is the framing used to support an arch or dome as it is being built until it can stand on its own.

b) **Procedures used for making a column formwork**

- Preparation, marking and layout
- Assembly of formwork panels and fixing the formwork (5marks @)
- Alignment and support
- Application of shuttering oil
- Final checks before concreting
- Pouring concrete
- Curing and De-shuttering

c) Types of formworks

-**Plywood formwork:** This refers to the remolded timber resin bonded plywood sheets that are often joined to timber frames to form panels of the desired sizes. Plywood is a versatile, robust and easy to work with material.

- **Timber formwork:** Is the oldest type of formwork used in construction. Timber formwork is a low cost, easy to work with shuttering material that can be cut and joined into any shape or size.

- **Steel formwork:** Is currently widely used because of its high strength, durability and ability to be reused repeatedly throughout time.