THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

071

BUILDING CONSTRUCTION
(For Both School and Private Candidates)

Time: 3 Hours ***Wednesday, 05th October 2011 p.m.***

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** the questions in sections A and B, and **two** (2) questions from section C.
3. Calculators are **not** allowed in the examination room.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (20 Marks)

Answer **all** questions in this section.

1. For each of the items (i) –(x), choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) The following are properties of hardened concrete, **except**
- A durability
- B curability
- C strength
- D impermeability to water
- E resistance to friction.

(ii) Before preparing foundations for different structures, investigation should be done to determine
- A irregularities in topography
- B ground erosions
- C ditches and flat grounds
- D characteristics of the underlying materials
- E streams and rivers near the site.

(iii) In cantilever of beam slabs, the steel should be placed
- A at the bottom of each concrete unit
- B at the centre of each concrete unit
- C at the upper part of each concrete unit
- D at any point within the concrete unit
- E at all intermediate supports.

(iv) If a brick is cut longitudinally, the pieces obtained are known as
- A half bat
- B queen closer
- C mitred closer
- D king closer
- E beveled bat.

(v) The objective of a roofing-felt is to
- A prevent effect of rain
- B prevent effect of dust and the wind
- C prevent excessive heat loss in winter
- D keep the interior of the building cool
- E avoid glare during construction.

(vi) A newly constructed building is finally handed-over to the owner by the
- A architect
- B building inspector
- C quantity surveyor
- D contractor
- E site foreman.

(vii) The ground movement caused by settlement may be due to
A expansion of soil carrying the building loads
B seasonal volume changes in the soil
C unstable ground underneath excavations
D earth movement in rocky sites
E felling of trees near the buildings.

(viii) A flying shore has the advantage that it
A prevents people to pass under the shoring
B terminates the arrangement of shoring to the wall
C enables enough space to be occupied by the shoring system
D helps to reduce the labour working costs
E provides a clear working space under the shoring.

(ix) In the drainage works, where an excavation of a trench is done within 900 mm from the existing building, the refill must be in concrete up to
A the underside of the existing foundations
B the top of the existing foundations
C 150 mm below the underside of the existing structure
D 150 mm top of the existing foundation
E 150 mm underside of the foundation of the existing structure.

(x) During timbering to trenches in compact soils the ceiling boards are placed
A diagonally across the sides of excavation
B horizontally against the sides of excavation
C diagonally across the width of the trench
D vertically against the sides of excavation
E diagonally against the walling board.

2. Match the items in **List A** with responses in **List B** by writing the letter of the corresponding response beside the item number. The options in **List B** can be used once, more than once or not at all.

List A	List B
(i) Thin vertical supports for the handrail to open stairs.	A. Nosing
(ii) The total horizontal length of a stair, including platform.	B. Tread
(iii) Horizontal surface member of each step in a stair.	C. Rise
(iv) The floor at either the top or bottom of a flight of stairs.	D. Going
(v) The main post of the railing at the bottom of a stair.	E. Bullnose
(vi) Enclosed chamber into which the stairs are built.	F. Winder
(vii) Horizontal distance of each step in a stair.	G. Stair well
(viii) The total floor-to-floor vertical height of a stair.	H. Headroom
(ix) Vertical face of the step in a stair.	I. Landing
(x) Vertical distance of the step in a stair.	J. Riser
	K. Run
	L. Balustrade
	M. Baluster
	N. Stringer
	O. Newel

SECTION B (40 Marks)

Answer **all** questions in this section.

3. (a) What is meant by "clearing the site"?
   (b) State three different ways in which the right angle may be used during setting-out on site.

4. Outline four main factors to be considered when laying copings on parapet walls.

5. (a) What is 'Primary flow' in hot water supply system?
   (b) Elaborate the purpose and advantages of using indirect cylinder in hot water supply systems.

6. (a) What are the following in arches construction?
      (i) Easing a centre
      (ii) Striking a centre

   (b) Outline four factors considered when deciding on the method to be employed in the construction of an arch.

7. (a) Mention three types of casement windows in a residential building.
   (b) List four types of ironmongery used in fixing casement windows.

8. Explain briefly the main risk of brick chimney stacks and suggest means to overcome the possible effects to the fire place.

9. State four advantages of steel formwork.

10. (a) Give four factors which affect the workability of concrete.
    (b) Explain the reason for a steel to be cranked in continuous beams.

11. State four properties that make hard wood a suitable construction material.

12. With the aid of sketches, distinguish shallow stair from a steep stair.

SECTION C (40 Marks)

Answer **two (2)** questions from this section.

13. (a) Soil tests on a certain site revealed that, the soil has poor bearing capacity. Suggest the three suitable types of foundation for a building to be erected on this site.

    (b) A brick pier 0.45 m x 0.45 m exerts a force of 200kN including the mass of the pier. Calculate:
      (i) The pressure per m^2 on the brick pier.
      (ii) The minimum area of foundation required if the soil has a bearing capacity of $150kN/m^2$.

(c) With the aid of sketches, explain the structural construction of the following:
(i) Lean-to roof
(ii) Couple roof
(iii) Timber flat roof.

14. (a) State five places suitable for constructing a manhole or an inspection chamber along a drain.

(b) Explain briefly the following methods of testing a drain before use:
(i) Air test
(ii) Smoke test
(iii) Ball test
(iv) Water test

(c) With the aid of a sketch, explain briefly about the construction of soak away pit as related to its functions.

15. (a) A deep foundation is to be excavated in a loose soil which is water logged. With the aid of simple sketches, explain three possible ways of dewatering the soil to allow the excavation work to proceed.

(b) A concrete slab of 150mm thick, with the length and width of 12000mm and 3000mm respectively is to be cast from concrete with mix ratio 1:3:6; calculate:
(i) The number of bags of cement required for the work if a bag of cement (50kgs) has the volume of $0.04m^3$, and then establish in cubic-metres, the quantities for fine aggregates and course aggregates in the concrete slab.

(ii) If a water/cement ratio of 0.6 is preferable in concrete making, determine the required litres of water.