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, 10th October 2012 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 central vertical member of a traditional casement window is known as
A stile B sill C transom D mullion E bottom.

(ii) A pipe conveying water from a storage cistern is called
A service pipe B distribution pipe C communication pipe
D main pipe E rising main

(iii) The following are types of subsoil except
A gravel B sand C silt D clay E rocks

(iv) Which of the following is not a load bearing wall?
A Fender B Retaining C Sleeper D Panel E Separating.

(v) Which of the following is a list of building materials with flooring materials only:
A Concrete, timber, zinc and polythene.
B Marble, linoleum, asphalt and timber.
C Linoleum, plastic tubes, cement and lead.
D Marble, thatch, asphalt and cladding.
E Timber, reinforcement rods, sand and paint.

(vi) The purpose of fixing architraves around door openings is to
A cover a joint between a frame or lining and wall
B locate the position of hinges in frames or linings
C provide key for the plaster work
D attach door frames or linings to walls
E allow anchoring of the door to frames or linings.

(vii) The liners are built in
A hearths to receive combustible materials
B chimney breasts to control circulation of air
C chimney pots to close the flues
D the fire back to facilitate reflections of heat
E fireplace recess to stabilize the fire back.

(viii) Main reinforcement rods are placed in concrete beams at places where there is
A minimum tensile stress
B maximum tensile stress
C shearing failure
D maximum compressive stress
E neutral axis

(ix) The drainage pipe systems start receiving the flow from
A inspection chambers B water taps C sanitary appliances
D cold water cisterns E water mains

(x) The type of roof which slopes in two directions with a break in the slope on each side is known as
A gable roof B hip roof C asymmetrically pitched roof
D mansard roof E gambrel roof.

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

List A		List B
(i)	Commissions the building works.	A. Architect
(ii)	Executes part of the works as assigned by the employer.	B. Quantity surveyor
(iii)	Certifies certificates for payments of the executed construction works.	C. Town planner
(iv)	Represents the main contractor to supervise the construction works.	D. Resident engineer
(v)	The owner of the building project.	E. Site engineer
(vi)	Verifies variations executed on the construction site.	F. Nominated sub-contractor
(vii)	Represents the consulting engineer on the construction site.	G. Technician
(viii)	Represents the project designer on the construction site.	H. Clerk of works
(ix)	Provides details for lifts, gas systems, air and sanitary systems.	I. Client
(x)	Takes measurements of all site works for evaluation purposes.	J. Water engineer
		K. Estimator
		L. Service engineer
		M. Contractor
		N. Domestic sub-contractor
		O. Draughtsman

SECTION B (40 Marks)

Answer **all** questions in this section.

3. With the aid of sketches, illustrate the following building structures:
(a) Axially loaded column.
(b) Eccentrically loaded column.

4. (a) Outline the composition of mortar as a building material.
(b) Briefly explain the preparation of three basic types of mortar.

5. Elaborate four methods employed in overcoming dampness in buildings.

6. Explain four advantages of the cavity wall in building construction.

7. State four requirements of a good formwork.

8. (a) Differentiate a door frame from door lining.
   (b) Where are door linings most suitably used as compared to door frames?

9. (a) Define a "stair".
   (b) Draw a plan sketch of a quarter turn stair and label two parts.

10. Outline the steps of performing 'Slump test' at the construction site and state its importance in construction.

11. (a) Define "timbering" as applied to excavation of trenches.
    (b) State two reasons of timbering to trenches.

12. Explain the following stair case terminologies:
    (a) A common stairway
    (b) A private stairway

SECTION C (40 Marks)

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

13. (a) Describe the following items as related to construction:
    (i) Granular soils
    (ii) Cohesive soils
    (iii) Soil bearing capacity.
    (b) A pad foundation occupies a ground area of 0.81 m^2 and is supporting a load of 162 kN. If the bearing capacity of the subsoil is 240 kN/m^2; show if the subsoil is suitable to support such a load.
    (c) With the aid of sketches, distinguish between solid ground floor and a suspended concrete ground floor.
    (d) Explain the advantage of a suspended concrete ground floor over solid ground floor.

14. (a) Sketch a part of vertical section through the opening of a fireplace built to the external brick cavity wall and show six essential parts.
    (b) Explain how a fireplace can facilitate ventilation in a room.
    (c) Elaborate the necessary treatments to be done around the opening of fireplace so as to allow smooth construction of the timber floor in the building.
    (d) With the aid of a well labeled sketch, show how the setting-out on sloping ground is carried out in short horizontal distances.
    (e) Explain briefly how cement is manufactured.

15. (a) A part of the fencing wall (cement-sand block) is measured above the plinth level and found to be 12 m long, 3 m high and 230 mm thick:

(i) If the jointing mortar applied in stretcher bond is 10 mm, estimate the number of blocks required for construction of the wall above plinth.

(ii) Calculate the labour cost of building the wall if the rate of laying each block is Tshs. 200/=

(iii) Calculate the labour charge for plaster works if the rate for plastering one square metre is Tshs. 750/= excluding the top part of the wall.

(iv) Calculate the number of bags of cement to be purchased for the work of plastering the wall, given that:

- The thicknesses of cement- sand plaster to be 15 mm. thick.
- The volume of 50 kg bag of cement to be 0.04 m^3 and the mixing ratio with sand to be 1:4.

Note: Any other assumptions made should clearly be shown.

(b) With the aid of single line sketches, differentiate direct cold water supply system from indirect cold water supply system in the residential house.