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, 06th November 2013 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 and Cellular phones are **not** allowed in the examination room.
4. 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 horizontal member sub-diving a window into two or more casements is known as
A mullion B stile C post D transom E middle rail

(ii) The fire extinguisher which is not used on electrical fires is
A dry powder B carbon dioxide C foam
D vapourizing liquid E water.

(iii) The suitable door to be used in an air conditioned room is a
A collapsible door B louvered door C glazed door
D swinging door E revolving door.

(iv) Concrete is cured in order to
A achieve higher strength B avoid cracking C avoid bleeding
D remain wet E remove dust.

(v) The horizontal projections at head and sill of a door frame which are embedded into the side walls for fixing the frame are known as
A horns B holdfasts C jambs
D rebates E hooks.

(vi) Reducing the moisture content of timber to a level consistent with humidity of air is
A warping B sawing C seasoning
D cupping E bowing.

(vii) What is the name of an opening left on flat roof for the purpose of lighting?
A Dormer window B Sky light C Lantern
D Gable window E Open sky.

(viii) Which of the following bonds is the strongest?
A Stretcher bond. B Header bond. C Dutch bond.
D English bond. E Flemish bond.

(ix) One of the following is **not** among classifications of windows basing on the methods of opening:
A Pivoted sash B Side hung casement sash
C Vertically sliding sash D Horizontal sliding sash
E Glazed casement sash.

(x) The function of cement in making concrete is to:
- A fill the voids between the aggregates
- B bind the aggregates together
- C produce the chemical reaction when mixed with water
- D avoid segregation
- E colour the concrete before use.

2. Match the items in **List A** with responses in **List B** by writing the letter of the corresponding match beside the item number.

List A		List B	
(i)	Under-burnt bricks indicated by a light colour and a dull sound when struck.	A	Bloating
(ii)	Mis-shapen bricks due to excessive heating in the kiln.	B	Iron spotting
(iii)	Badly cracked and misshapen bricks due to rain falling on them.	C	Grizzling
(iv)	Unsightly discolouration of bricks containing lime and iron sulphide .	D	Crazing
(v)	Discolouration of bricks by the formation of white deposit due to large proportion of soluble salts.	E	Scumming
(vi)	The presence of excess carbonaceous matter in the clay.	F	Hearting
(vii)	Fine cracks on glazed bricks due to uneven shrinkage and expansion between glaze and clamps.	G	Shuffling
(viii)	Fussing together of the clamp-burnt bricks to excessive heat.	H	Efflorescing
(ix)	Surface dark patches due to presence of iron sulphide in the clay.	I	Crushing
(x)	Vitrified surfaces of bricks while the interior of brick remains black due to heating too rapidly in the kiln.	J	Crozzling
		K	Lime noduling
		L	Laminating
		M	Shearing
		N	Sagging
		O	Clinkering

SECTION B (40 Marks)

Answer **all** questions in this section.

3. Mention eight possible causes of industrial accidents.

4. With the aid of sketch, elaborate the application of raft foundation.

5. Define a "monolithic wall" and describe two examples.

6. (a) What is site investigation?

   (b) Outline three purposes of conducting site investigation.

7. (a) State four functional requirements of iron mongery.

(b) Distinguish between rim latch and rim dead lock.

8. (a) Explain 'scaffolding' as applied in building construction.

(b) State three points to remember when using scaffolding in construction.

9. (a) Briefly describe 'timbering' as applied in foundation trenches.

(b) Differentiate ordinary excavation from deep excavation in foundation trenches.

10. (a) Explain the roofing membrane as applied in flat roofing system.

(b) State three functional requirements of roof sheet coverings as used in conjunction with steel roof trusses.

11. Outline two ways of testing drains and explain how each is carried out.

12. Calculate the volume of concrete ingredients for a lintel, which is 1200 mm long, 112 mm wide and 150 mm deep; given that the concrete mix ratio is 1:2:4 (cement: sand: course aggregates) by volume batching.

SECTION C (40 Marks)

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

13. (a) (i) What are the functions of a fire place?
(ii) Distinguish superimposed hearth from constructional hearth in a fireplace.
(04 marks)

(b) Draw a neat sketch of a section through a first flight of concrete stair and label at least ten parts.
(09 marks)

(c) List down four information that can be obtained from boreholes and outline three possible technical reasons for drilling boreholes in construction works.
(07 marks)

14. (a) With the aid of neat sketches, classify the beams basing on their supports in construction works. **(15 marks)**

(b) Outline five functional requirements of the water supply system. **(05 marks)**

15. (a) The total length, width and depth of the strip foundation trench are 72.2 m, 700 mm and 900 mm respectively:
(i) If a lorry can carry 3.5 m^3 of soil per trip, find the number of trips of hauling the excavated soil.
(ii) If the 230 mm thick mass concrete (1:3:6) is for footing of the strip foundation, how much sand (in m^3) will be required for the work?

(iii) If the volume of a 50 kg bag of cement is 0.04 m^3, calculate the number of bags of cement which should be purchased for the work.

(iv) If the cost for casting $1m^3$ is Tshs. 30,000/=, how much money will be paid for concreting the footing?

(09 marks)

(b) Elaborate how the cement concrete ground floor is prepared.

(06 marks)

(c) With the aid of sketches, show how the drain pipe is built through the wall under the ground.

(05 marks)