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 **14 November 2001 a.m.**

Instructions

1. This paper consists of sections A, B and C.
2. Answer ALL questions in sections A and B and TWO (2) questions from section C.
3. Write your Examination Number on every page of your answer booklet(s).

This paper consists of 5 printed pages

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) One function of a window sill is to

A allow free air circulation
B serve as a decoration to a house
C shed away the rain water from the window
D serve as an aid during emergency exit
E serve as a shelter to the window.

(ii) The following are reasons for providing openings in a building wall **except** to

A provide vision outside
B allow space for door and window
C provide access to the occupants
D act as a decoration
E allow free air circulation.

(iii) The function of a baffle wall in a septic tank is to

A prevent the sewage solids from passing through and direct it back to the bottom of the tank to be broken into liquid and sludge
B allow the waste liquids to pass through the tank and control the flow of effluent to the soakaways
C prevent the sewage solids from passing through and directs it to the bottom of the tank to be broken into liquid and sludge and to control the flow of effluent to the soakaways
D prevent the flow of effluent from passing straight to the soakaways
E allow the sewage solids to pass through and direct it back to the bottom of the tank to be broken into liquid and sludge.

(iv) The main reason of providing throat units on top of the fireback is to

A allow the volume of heated air to escape through the flue
B allow the volume of heated air to enter through the flue
C prevent the volume of cold air from escaping through the flue
D allow the volume of cold air to enter through the flue
E prevent the volume of heated air from escaping through the flue

(v) An inclined surface for foot or vehicular traffic used in buildings where steps would be dangerous is a

A ramp B nosing C flight D baluster E handrail

(vi) The difference between columns and beams is that

A columns support all loads above and transmit them to beams which in turn take these loads down to the foundation
B columns support all loads under them and transmit them (the loads) to the beams which in turn take them up to the foundation
C beams support all loads above and transmit them to the columns which in turn take them down to the foundation
D beams support all loads under them and transmit them (the load) to columns which take imposed loads only to the foundation for supporting
E beams transmit all loads to the foundation and support columns which carry dead and imposed loads from the foundation.

(vii) The following metals are used as roof covering materials **except**

A lead B copper C zinc D iron E aluminium.

(viii) A "gutter" is a device fixed to the

A ends of roof eaves, for the purpose of draining out rain water from droping directly to the roof surface
B ends of window for the purpose of removing rain water from dropping directly to the window sill
C inside of the window for the purpose of directing light inside the building
D the end of roof eaves for the objective of draining rainwater from droping directly to the wall surface
E the top of the door for the purpose of draining rain water from entering the building.

(ix) The suitable materials for making fireback for the construction of fire place are

A reflective aluminium plates of very small thickness
B clays containing low proportions of sand with alumina
C clays containing high proportions of sand and silica
D reflective aluminium plates coated with iron
E clays containing high proportions of sand and alumina.

(x) What is the difference between architrave and door lining?

A Architrave is a decorative moulding fixed or cut around doors and windows to emphasize and decorate the opening while the door lining is a timber board 25 mm or 32 mm thick and is as wide as the reveal of the opening in which the door is hung
B Architrave is a decorative moulding fixed to windows only for decoration of window while door lining is a timber board for supporting door frame
C Architrave is a supporting wedge at the window frame placed during construction for strength while door lining is a decorative feature fixed on door surface
D Architrave is a supporting device for casement windows while door lining is the top part of a flash door
E Architrave is a decorative device for doors only which is placed at the top face of the door while door lining is a supporting device for a door for friction reduction during opening

2. Match the items in list A with the responses in list B by writing the letter of the correct response beside the item number.

LIST A

(i) Contractor

(ii) Lean-mix-concrete

(iii) A factor to be considered when determining the size of fire place

(iv) Dewatering

(v) The process of covering the outside of the frame to provide a base for the exterior finish

(vi) Function of wall plate

(vii) Ground water table

(viii) Roof covering materials

(ix) Extrados

(x) Glazing

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LIST B

A Level at which water occurs naturally below the ground

B Type of fuel to be burnt

C Process of removing or adding water to the excavation for construction works to proceed smoothly

D Forms a firm level surface on which timber joist can bear and spreads the point load from joist uniformly along the wall length below it

E The placing of mirrors in the prepared places like baths and bed rooms for dressing purposes

F The external curve of the arch

G A person whose role is to carry out the design and supervision work

H Type of flue to be heated

I Panelling

J Forms a level surface on which gutters can rest and assist the gutter to take rain water to the discharge pipe

K Level at which water stays after pumping the spring water in the excavated trench for construction purposes

L The securing of glass in prepared openings like doors, windows and partitions

M The wedge shaped bricks or blocks which comprise an arch

N A person whose role is to carry out construction work

O Tiles, slates and ceiling boards

P Materials used for road construction works especially in road base where bituminous surfacing is to be used

Q Sheathing

R Material used for filling of roof joints especially in places where bituminous materials are preferred

S Process of removing or excluding water from the excavation for the construction works to proceed with less inconvenience

T Thatch covering, shingles and tiles

SECTION B (40 marks)

Answer **ALL** questions in this section

3. Write down four functions of upper floors.

4. List four purposes of thermal insulation of walls.

5. Define four of the following terms as used in stairs:
   (a) Tread (b) Riser (c) Rise (d) String (e) Balustrade.

6. Mention four requirements of a good roof.

7. Explain briefly what you understand by dampness due to structural causes.

8. What are the four disadvantages of using tubular steel scaffolding for temporary staging, posts and bracings to support heavier loads?

9. (a) What is a foundation?
   (b) Write short notes on concrete piles as applied to pile foundations.

10. Give two reasons why external doors are fixed to open outwards.

11. List two site clearance activities for the construction of a large spanned building.

12. (a) What is the main purpose of an intercepting trap in a drainage system?
    (b) What is the disadvantage of an intercepting trap in a drainage system?

SECTION C (40 marks)

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

13. (a) The mix ratio of reinforced concrete meant for foundation works is 1:2:4. If 5 bags of cement each weighing 50 kg are used but during unloading of cement bags a wastage of 20 % occurs, calculate
    (i) the amount of water needed in litres given that water/cement ratio is 0.4 and 1 litre of water = 1 kg
    (ii) the amount of sand needed for the work which needs the amount of water computed in (i) above
    (iii) the amount of aggregate for the work.
    (b) List five places along the drainage system where inspection chambers must be placed.

14. (a) Explain briefly two methods of ensuring safety when working in trenches.
    (b) Describe the main operations of R.C.C. columns construction.
    (c) Mention five advantages of steel roof trusses over timber roof trusses.

15. (a) List the chief ways through which moisture gets into the walls of a building.
    (b) Explain briefly two types of settlements of a building foundation.
    (c) Mention five factors that determine the size of gutters and down pipes.