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

072

ARCHITECTURAL DRAUGHTING
(For Both School and Private Candidates)

Time: 3 Hours **19 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).

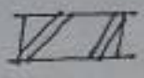
This paper consists of 7 printed pages.

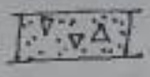
SECTION A (20 marks)

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) The following symbol and convention is used to represent hardcore in Architectural Draughting:

A 

B 

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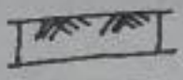
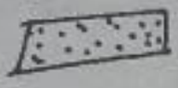
D 

E 

(ii) In Architectural Draughting screed is defined as the

A roof finish which is framed by placing roofing materials and ceiling boards
B door finish which is associated with painting and decorating the inner surface of the door
C wall finish which is formed by placing the plain concrete on the outside of the wall surface
D floor finish which is formed by mixing cement and sand with a definite ratio
E floor finish which is formed by placing floor tiles on service rooms such as a kitchen.

(iii) The part of a house which should be isolated and placed in a quiet area is the

A bathroom B kitchen C veranda
D sitting room E bedroom

(iv) As far as roof design is concerned a span is the

A horizontal distance between two walls of a building
B vertical distance between the inclined part of the pitched roof
C inclined distance between two walls of a building where the roof is placed
D horizontal distance between outer edges of the wall plates
E horizontal distance between inner edges of the wall plates.

(v) In a working drawing drawn to a scale of 1:50, a room side was represented by 84 mm. What was the actual side length of the room?

A	84 m	B	0.84 m	C	4.2 m
D	420 cm	E	4200 mm		

(vi) The following is **not** a type a of single pitched roof:

A	Couple roof	B	Collar roof	C	Lean to roof
D	Doubled lean to roof	E	Gable roof.		

(vii) The difference between separate and combined drainage systems is that

A in a separate drainage system foul and surface water run separately while the combined drainage system is used where the public sewer takes foul and surface water to the main sewer

B in a separate drainage system fouls and surface water are combined while the combined drainage system separates fouls from surface water before discharging them to the sewer

C in a separate drainage system fouls are separated from surface water after reaching the sewer while the combined drainage system combines fouls and surface water at the point of entering the sewer

D combined drainage system is used where private drainage takes foul (soil) and discharge it to the sewer before contaminating surface water while separate drainage system is used where the public sewer takes foul (soil) to the main sewerage

E separate drainage system is used where public sewer takes both foul (soil) and surface water to the main sewer while combined drainage system is used where private drain takes foul (soil) without surface water and discharges it to sewer where surface water is mixed with foul

(viii) A flue is defined as a

A void through which products of combustion enter
B fire place where heating takes place
C space through which smoke enters
D space through which gases from fireplace are kept
E space through which smoke and gases pass.

(ix) The following detail is **not** applicable for cross-sections when preparing Architectural drawings:

A The height of doors, windows, cupboards and ceilings
B The exact location of doors, windows, cupboards or any other features that can be seen by using standard symbols
C Depths and widths of foundations, beams, walls and floors
D The details of stair cases
E The drainage arrangement and the slope of the roof.

(x) As far as stairs are concerned the difference between going (of step) and landing is that landing is a

A sloping member supporting the step while going is the vertical distance between the faces of two consecutive steps
B thin horizontal support for the handrail while going is the horizontal distance between faces of two consecutive risers
C vertical platform between adjacent flights of stairs while going is an inclined member supporting the steps
D horizontal platform between successive flights of stair while going (of step) is the horizontal distance between the faces of two consecutive risers
E thick vertical support for the balustrate while going is the horizontal distance between faces of two consecutive handrails.

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) General rule for linear dimension
(ii) Site plan
(iii) The front view of the object
(iv) A roof that has two slopes with a ridge in the middle
(v) Some details which are shown in a floor plan
(vi) Recommended scales for detailed drawings
(vii) The definition of the perspective drawing
(viii) Types of staircases
(ix) Basic functions of building specifications
(x) Method of preventing eddy currents from interfering with the flow of smoke in the chimney

LIST B

A This is the first angle projection of an object on a fixed plan from a variable point
B 1:1 or 1:5
C Elevation
D Geometric, open well, circular and straight flight stairs
E Opening the fireback when wind is blowing for a chimney to operate efficiently
F Written instructions, legal documents, basis for estimating materials and costs
G Decimalised numbers to three decimal places indicate metres
H Plan which shows the outline of a building plot in relation to the main roads of towns and helps the reader to locate the plot
I Section
J This is the projection of an object on a fixed plane from a fixed point
K North direction, sizes and spacing of all supporting members
L Whole numbers without decimals indicate metres
M Plan which shows the location of a building in relation to the boundaries of the plot
N Pitched roof
O Details of staircases and ground plan
P Extending the chimney above the roof not less than 600 mm
Q Straight landing, quarter turn, half turn and open well stairs
R Contract document, legal document, basis for estimating materials and costs
S 1:100 or 1:500
T Gable roof

SECTION B (40 marks)

Answer **ALL** questions in this section.

3. Explain how a traditional fireplace works.
4. How do material quantity estimates help the owner of a building before it is constructed?
5. What is the importance of drawing elevations of buildings?
6. Write in long form the following abbreviations as applied in perspective drawings:
   (a) H.L. (b) P.P. (c) V.P. (d) C.S.
7. Sketch the following types of eaves:
   (a) Flush eaves (b) Closed or boxed eaves
8. Mention the major zones (divisions) of a residential house.
9. List four dimensions that should be shown on a floor plan.
10. Define the following terms:
    (a) An elevation of a building (b) A cross section of a building.
11. List down the primary functions of windows and doors in a residential house.
12. What is the use of the following lines as applied in Architectural Draughting?
    (a) Thick line (b) Dotted line (c) Short zig zag line (d) Long chain line

SECTION C (40 marks)

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

13. Figure 1 shows the plan and section A-A of a guard's quarter at one of Tanzanian Technical Secondary Schools main gate. The given dimensions comply with the recommended dimensions for Architectural Drawing.

    (a) Calculate the
        (i) volume of soil which should be excavated during trench preparation for the foundation
        (ii) volume of concrete for the strip foundation.

    (b) If one bag of cement is 0.04 m^3, one lorry carries 4.5 m^3 of either fine or coarse aggregates and the concrete mix ratio for both foundation and floor concrete is 1:2:3; calculate the number of
        (i) cement bags required for both foundation and floor concrete
        (ii) lorry trips to suffice the required quantity of aggregates.

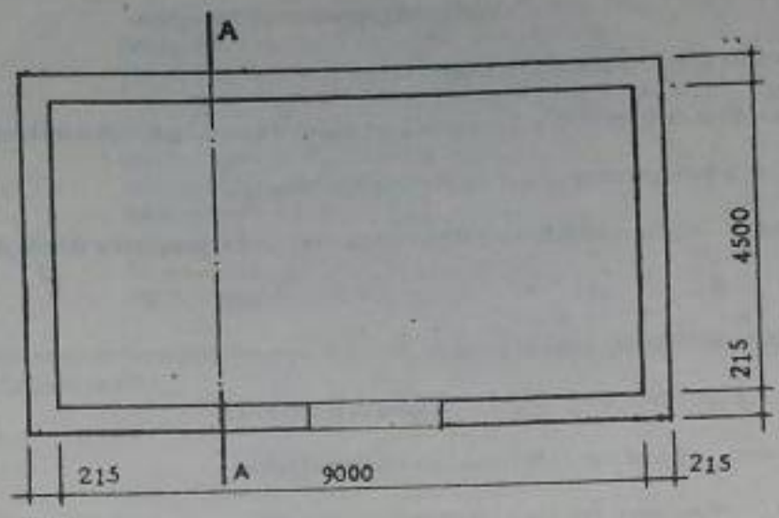
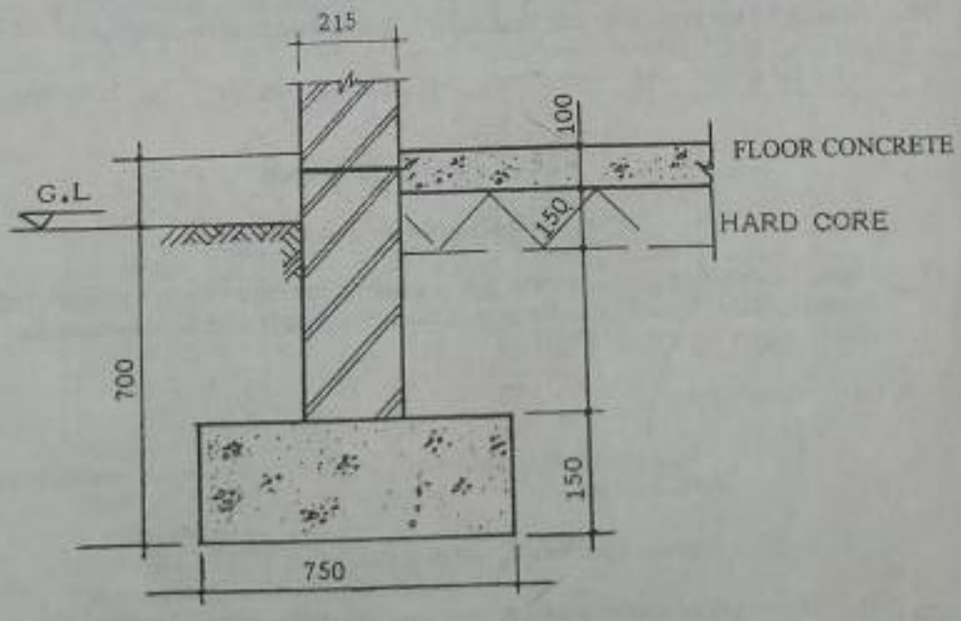


Fig. 1(a)

GUARD'S QUARTER PLAN (NOT TO SCALE)



Section through A-A of guard's quarter.

Figure 1(b)

14. Figure 2 shows the plan (not to scale) of a residential building whose construction details are as outlined below:

(a) Finished floor (F.F.L.) is 250 mm above ground level (G.L.)
(b) Solid ground floor with 150 mm thick hardcore, 100 mm thick oversite concrete and cement sand screed finish of 25 mm thick.

(c) A D.P.C is provided in the appropriate position.
(d) All walls above F.F.L. are 150 mm and a height of 2900 mm from F.F.L. to underside of wall plate.
(e) Foundation walls are 225 mm thick and extend 300 mm deep below G.L.
(f) The foundation is of strip type with 525 x 150 mm cross-section.
(g) Lintels of reinforced concrete 225 mm deep and 150 mm wide over all doors and windows, all at the same level 2000 mm above F.F.L.
(h) Door openings, including door frames are 1000 mm wide and 2000 mm high.
(i) Windows are 1100 mm high. Type W_1 is 1800 mm wide.
(j) The covering is corrugated iron sheets, sloping at 30°, rafters of 100 x 150 mm, purlin 50 x 50 mm, wall plate 100 x 50 mm centrally placed, ceiling joints 100 x 50 mm, soft ceiling boards and open eaves projecting 500 mm from external face of wall with facia board 25 mm thick around the whole roof.

To a scale of 1:20, draw a typical section A-A showing all necessary dimensions with all relevant material symbols.

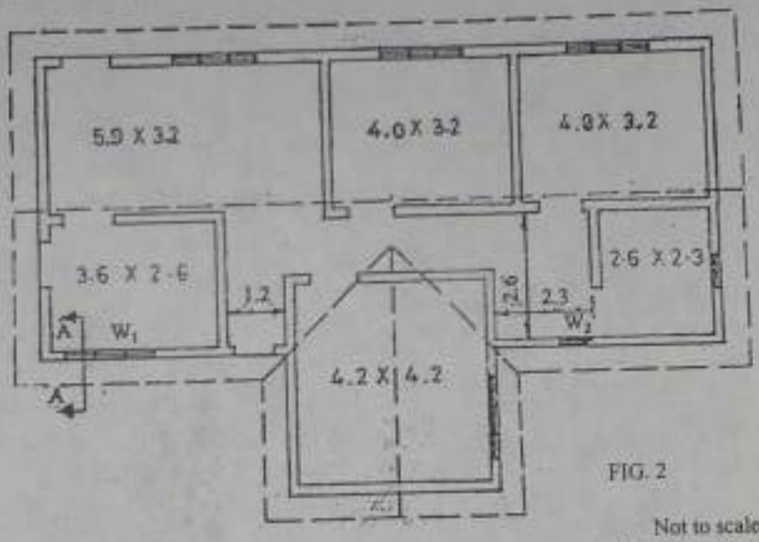


FIG. 2

Not to scale
(All dimensions in m)

15. The following details apply to a straight flight timber stair case:

- Treads and risers are 250 mm and 180 mm respectively
- The total going is 3800 mm and rise is 2700 mm
- The width of the stair which is also the width between the two walls in which the balustrades are fixed is 1200 mm.

To a scale of 1:25 draw

(a) the sectional elevation of the staircase
(b) the plan of a stair.

Any other assumptions should clearly be shown on the drawing.