

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

Monday, 19th October 2009 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. Drawings should be in pencil and all drawings in section C should be in a standard paper format.
4. Electronic Calculators are **not** allowed in the examination room.
5. Cellular phones are **not** allowed in the examination room.
6. 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) to (x), choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) Beam compasses are used to draw

- A beams of buildings
- B accurate and fine work
- C larger circles that are not possible with ordinary compass
- D small circles and arcs
- E arched beams in public buildings.

(ii) In preparation of Architectural drawings, North point is shown on:

- A Foundation plan, site plan, floor plan and roof plan
- B Floor plan, section of the wall and site plan
- C Front elevation and section of the foundation plan
- D Site plan, floor plan and the longitudinal section of the foundation
- E Block plan, foundation plan and roof section.

(iii) The electric symbol  shows:

- A One way switch
- B Two way switch
- C Wall socket lighting
- D Fan switch
- E Intermediate switch.


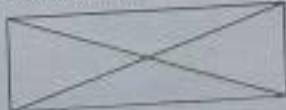



(iv) In design of residential house, how can the space below the staircase be economically utilised?

- A By provision of store or toilet
- B By converting it into a reading room
- C By constructing it as a servant's room
- D By constructing it as dressing room
- E Utilizing it as a lobby.

(v) The plan of a building will show:

- A The height of windows and doors
- B The foundation details
- C The vertical dimensions of rooms and openings
- D The orientation and location of rooms, doors, windows and room size
- E The foundation detail, location of doors and windows, size of rooms and orientation of the rooms.

- (vi) The functions of a window are:
- A Ventilation, lighting and access to the rooms
 - B Security against theft and protection from weather effects like rain, wind etc
 - C Passage of air to the other side of the building, lighting and entrance to different rooms
 - D Daylight, ventilation and view in or out
 - E Decoration, ventilation and passage of people
- (vii) In perspective drawing:
- A The object is drawn as it would appear to the eye from a certain position.
 - B The plan is drawn below the elevation while the side view is drawn on the left hand side of the plan.
 - C The object is drawn with the horizontal lines inclined at 30° and the vertical lines truly vertical.
 - D All horizontal lines are drawn to true dimensions and inclined at 45° while the vertical lines are drawn truly vertical.
 - E The horizontal lines are drawn truly horizontal on one face while in the next face, the lines are inclined at 45° and drawn to half true size.
- (viii) In an architectural drawing the abbreviation "G.T." means:
- A Government of Tanzania
 - B Government Transport
 - C Ground Touching (in perspective drawing)
 - D Gully trap
 - E Ground level
- (ix) What is the material symbol used for unwrought timber?

- A 
- B 
- C 
- D 
- E 



- (x) The main aim of tracing drawings on tracing papers is to:
- A Use the tracing papers as means of tracing any defect or faulty drawing for correction.
 - B Use it as a negative for the making of any numbers of further copies.
 - C Be used by the construction engineer for setting out the building.
 - D Show the details that showed appear on a working drawing
 - E Be used by the architect or client to estimate the cost of the whole construction project.

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

List A	List B
(i) The role of client in the construction business.	A Arrangement of various rooms and room sizes, height of doors and windows.
(ii) The purpose of introducing a septic tank in a drainage system.	B Above the front elevation
(iii) The lower framing member of a window frame.	C 1:1; 1:10; 1:50; 1:100
(iv) The recommended scale to be used when drawing components and assembly detailed drawings.	D An imaginary vertical plane which passes through the station point and centre of vision.
(v) The meaning of the term C.P. in perspective drawing.	E To retain the effluents for at least 24 hours to allow bacteria to digest the solid particles.
(vi) Definition of a drawing.	F A double roof.
(vii) The location of Plan when Orthographic drawing is projected in the first angle method.	G They give information that cannot be shown by the use of drawing lines only.
(viii) The importance of providing specifications on drawings.	H Below the front elevation.
(ix) Some of the things shown on site plan.	I To design and finance the project.
(x) Mono-pitched roof anchored into the wall.	J Sill
	K The object shown on papers or maps by use of lines or graphics.
	L 1:1; 1:5; 1:10; 1:20
	M To initiate and finance the project.
	N They magnify the size of the drawing to the users/readers.
	O A lean-to roof
	P To allow for access into the drainage system for inspection and cleaning purposes.
	Q Sill
	R A change point where the eye of the observer is located while viewing the object.
	S Representation of an object by systematic lines on a piece of paper.
	T Location and orientation of the building

SECTION B (40 Marks)

Answer **all** questions in this section.

3. List down four (4) factors on which the design of a building depends.
4. Define the following terms as applied in Construction business:
 - (a) Clerk of works;
 - (b) Statutory Authority.
5. Outline four (4) items of information shown on the Floor plan working drawing.
6.
 - (a) What is the aim of drawing a margin on drawings?
 - (b) Residential buildings are divided into three major areas. List them.
7. Draw a queen post truss and label it.
8.
 - (a) List down two (2) principles of lettering
 - (b) What is a scale drawing?
9. Name four (4) types of staircases.
10. Explain the difference between "Clear span" and "Effective span" as used in roof design.
11. Mention four (4) classes of alphabets used in the draughting language.
12. Define the following terms as applied in perspective drawing:
 - (a) V.P
 - (b) P.P
 - (c) A.G.P
 - (d) G.P

SECTION C (40 Marks)

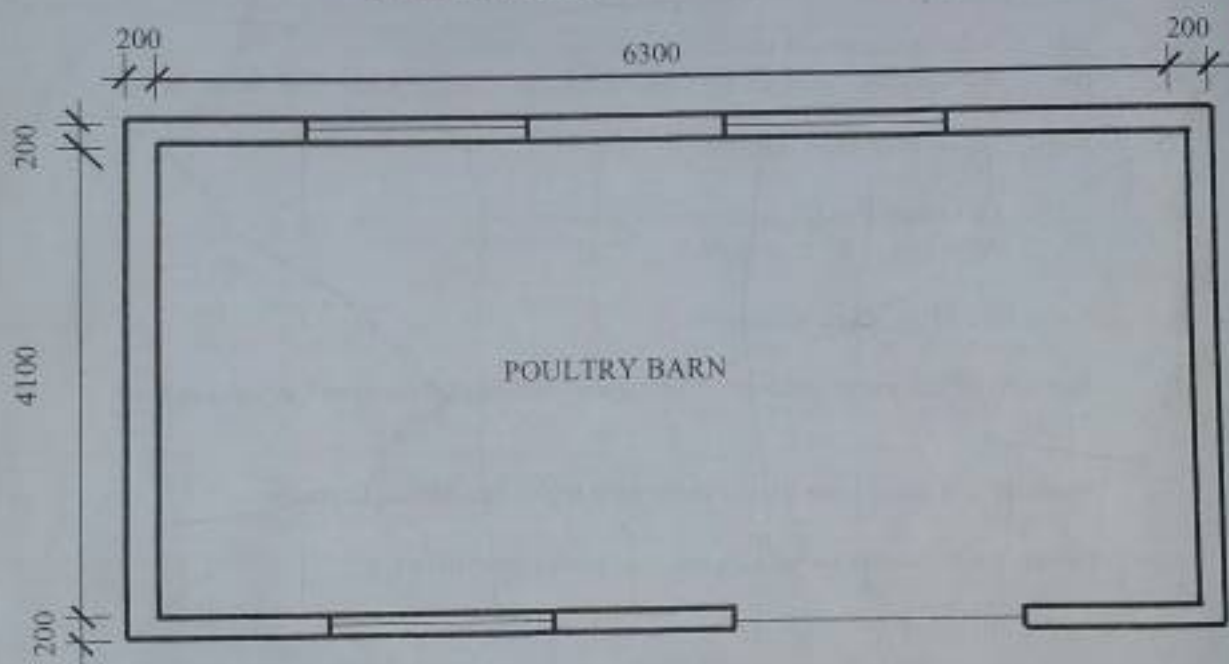
Answer **two** (2) questions from this section.

13. A ledged, braced and battened door has the following information.
 - Overall width of door is 980mm
 - Overall height of door is 1980mm
 - The width of each batten is 140mm excluding the tongue which is 10mm deep and the battens are 20mm thick (joined by T&G joint)
 - Each of the ledges and braces has a size of 120mm x 25mm.
 - The ledges are terminated 15mm off the edges of the sides of a door and fixed 150mm off the top and bottom edges of the door.

To a scale of 1:10, draw:

- (a) The internal elevation of a door.
- (b) The longitudinal section Y-Y of a door.
- (c) The horizontal cross section X-X of a door.

(Show all necessary dimensions).



(All dimensions are in mm)

Figure 1: FLOOR PLAN (NOT TO SCALE)

14. Figure 1 shows a floor plan of a poultry barn of a hipped roof. Some of the construction details are as outlined below:

- (a) Brick wall thickness 200mm.
- (b) Wall plates, common rafters, hip rafters and jack rafters each one is 60mm x 100mm. Wall plates are centrally placed over the walls.
- (c) Ridge board is 20mm thick.
- (d) Roof overhang is 600mm in all four wall sides.

- (e) Spacing between rafters are at 1100mm centres. This spacing is the same from each outside edge of the wall plate to the centre of each of the first jack rafter.
- (f) Hip rafters are placed exactly over each of the wall-plate intersections at the wall corners.

To a scale of 1:30, draw a skeleton roof plan showing all the stated timber roof members including the walls; and hence dimension it fully.

- 15.
- (a) State two (2) uses of schedules in the building works.
 - (b) Write short notes on the fire-box as the main part of a fireplace.
 - (c) The internal concrete block load bearing wall of 150mm thick is directly supported by a concrete block foundation wall of 230mm thick and 550mm deep built over a concrete footing 450mm wide and 150mm deep. The foundation wall is constructed between the solid ground floor composed of 150mm hardcore, 50mm blinding, 100mm over-site concrete and 25mm screed.

To a scale of 1:5 draw the sectional detail of this construction showing the footing, foundation wall, part of the internal wall and the surrounding floor structure. Show all the dimensions.

