

TECHNICAL DRAWING

EXAMINATION SCHEME

There will be three papers, Papers 1, 2 and 3 all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

PAPER 1: will consist of forty multiple-choice objective questions all of which are to be answered in 1 hour for 40 marks. The paper will consist of two sections, Sections A and B as follows:

SECTION A: will consist of (30) questions drawn from the general principles, techniques and uses of plane and solid geometry.

SECTION B: will consist of (10) questions in two alternative parts:
Part I (Building Drawing) and Part II (Mechanical Drawing).
Candidates may answer questions in either part.

PAPER 2: will consist of five essay questions on plane, solid and vector geometry. Candidates will be required to answer any three in $1\frac{3}{4}$ hours for 60 marks.

PAPER 3: will consist of two sections, Sections A and B to be taken in $2\frac{3}{4}$ hours for 100 marks.

Section A: will consist of three questions requiring sketches of objects, components, symbols and tools used in the Building and Mechanical industries. One of the questions will be compulsory.

Candidates will be required to answer the compulsory question for 20 marks and one of the other questions for 10 marks. The section will require 45 minutes.

Section B: will consist of two questions: one in Building Drawing and the other in Mechanical Drawing. Candidates will be required to answer either of the two questions in 2 hours for 70 marks.

SAMPLE QUESTIONS

PAPER 1

(OBJECTIVE)

Section A

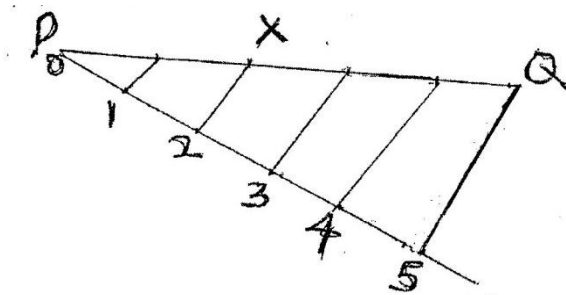


1. The drawing instrument shown in the figure above is used for drawing
 - A. vertical line.
 - B. horizontal line.
 - C. slanting line.
 - D. curve.
2. Which of the following materials should **not** be used to hold paper on a drawing board?
 - A. Paper tape
 - B. Cello-tape
 - C. Pin
 - D. Clip
3. Which of the following angles **cannot** be constructed with instrument?
 - A. 30°
 - B. 45°
 - C. 60°
 - D. 70°

4. The **minimum** character height for dimensioning on AO paper is

- A. 2.5
- B. 3.5
- C. 4.5
- D. 5.5

5. What is the ratio of length **PX** to **PQ** in the figure below?

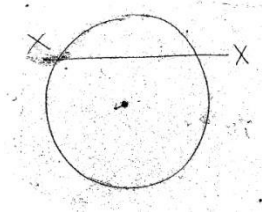


- A. 5:2
- B. 4:2
- C. 2:5
- D. 2:4

6. Which of the following is **not** a plane figure?

- A. Square
- B. Cone
- C. Trapezium
- D. Parallelogram

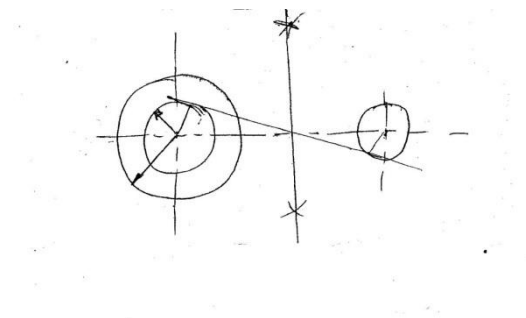
7.



In the figure above, the line **X-X** divides the circle into

- A. semi-circle.
- B. sector.
- C. segment.
- D. quadrant.

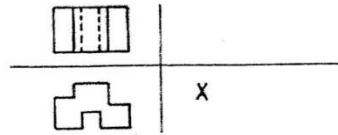
8.



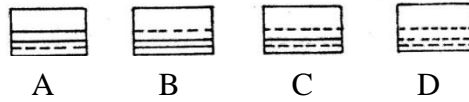
The figure above shows the construction method of drawing a/an

- A. tangent to a point on circle.
- B. tangent to a circle from outside point .
- C. external tangent to two circles.
- D. internal tangent to two circles .

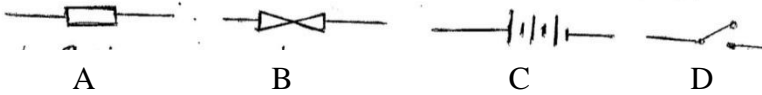
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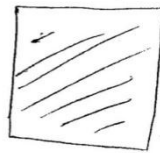
The view X of the block shown in third angle above is



10. Which of the electrical symbols below represents a resistor?



11. What does the material symbol shown below represent?



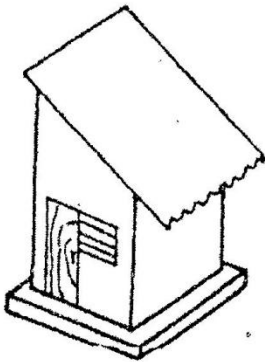
- A. water.
- B. insulator.
- C. glass.
- D. steel.

Section B

(Part I)

[Building Drawing (Optional)]

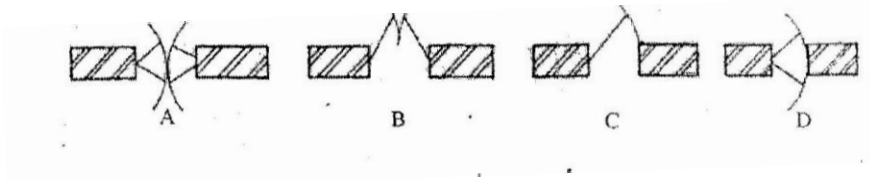
12.



The type of roof shown in the figure above is a

- A. shed roof.
- B. hip roof.
- C. gable roof .
- D. butterfly roof.

13. Which of the following door symbols represents single leaf double swing?

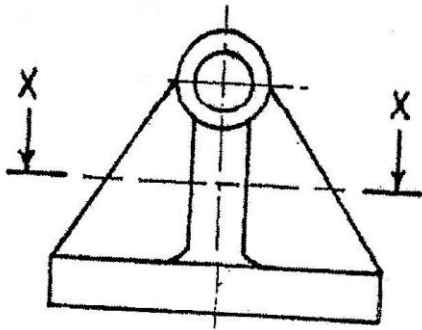


Part II
[Mechanical Drawing (Optional)]

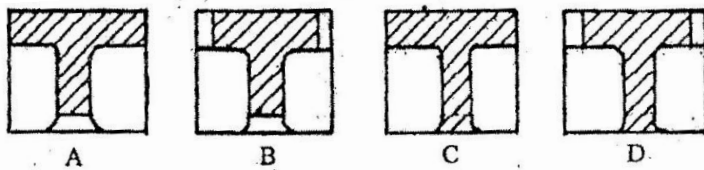
12. Which of the following is **not** a temporary fastener?

- A. Bolt
- B. Rivet
- C. Stud
- D. Screw

13.

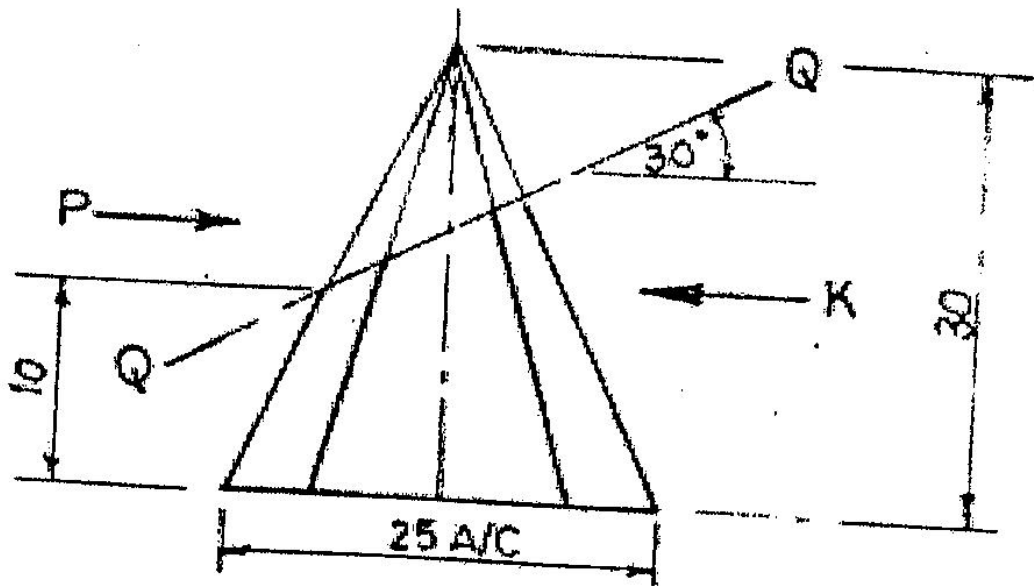


Which of the following shows the sectional view of the object above?



PAPER 2
(ESSAY)

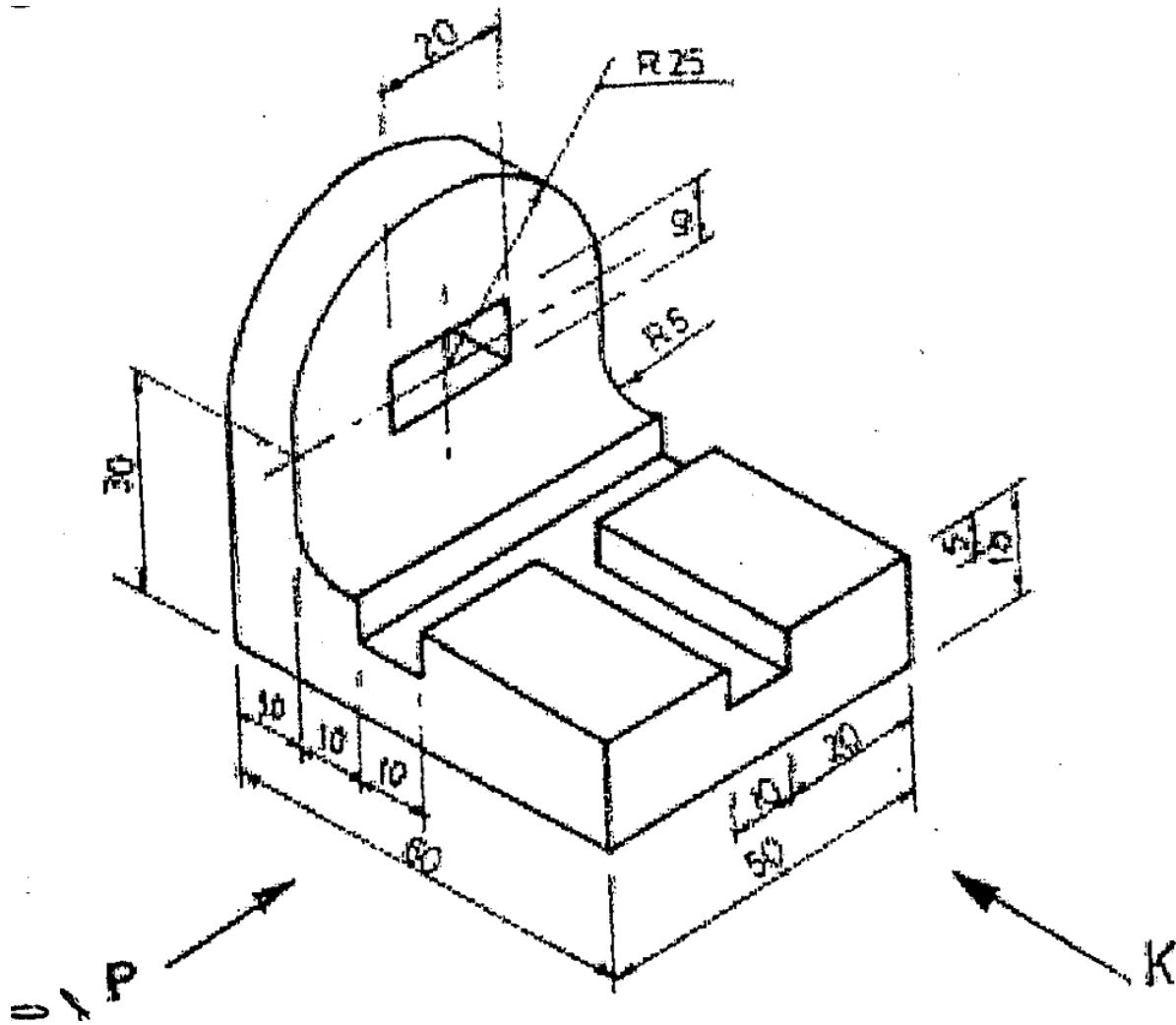
1. A hexagonal based pyramid is cut by a plane **QQ** as shown below.



Draw, using scale 2:1, the:

- (a) given elevation;
 - (b) plan;
 - (c) end elevation into the direction of arrow **P**;
 - (d) true shape of the section.
2. (a) (i) Construct a regular heptagon in a circle of diameter 70.
(ii) State the length of the side of the heptagon.
- (b) (i) Construct a similar heptagon whose area is 1.6 times the area of the given heptagon.
(ii) State the length of the side of the enlarged heptagon.

3. The pictorial view of a sliding block is shown below. Draw in the first angle projection, the full size of the following views, with hidden details:
- (a) front elevation in the direction of arrow K;
 - (b) plan;
 - (c) end elevation in the direction of arrow P.

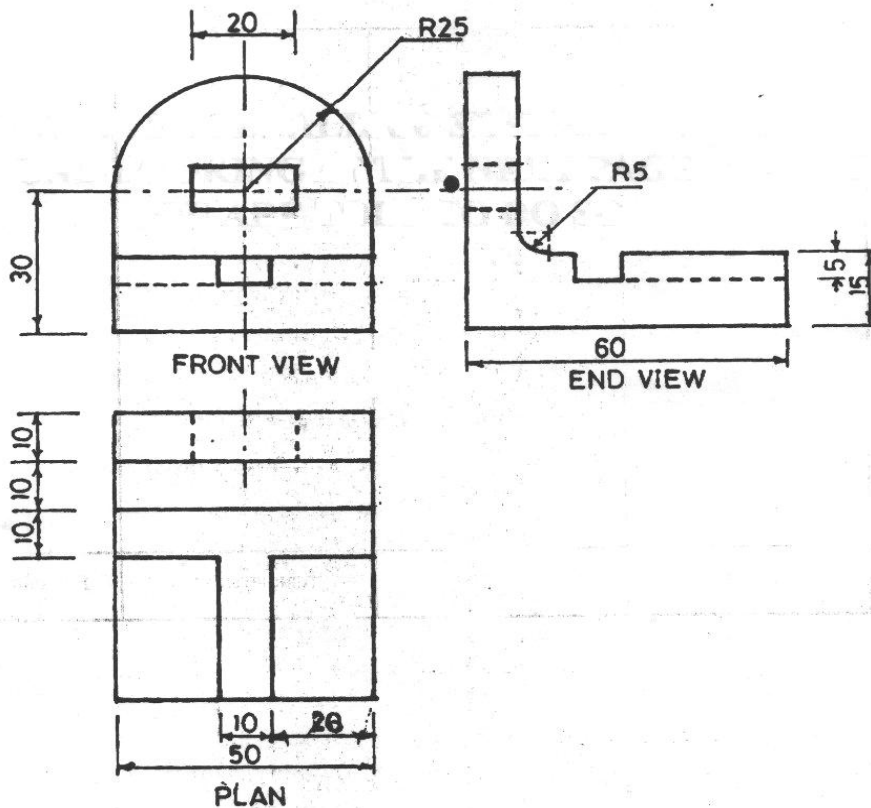


4. An ellipse has a major axis 120 and minor axis 80.
- (a)
 - (i) Determine by construction, the positions of the two foci and state the distance between them.
 - (ii) Use the foci method to construct the ellipse in full size.
 - (b)
 - (i) Construct a tangent to the ellipse at a point 30 above the major axis and to the left of the minor axis .
 - (ii) Determine the distance of the tangent point from the two foci.

PAPER 3
SECTION A
[Freehand Sketching]

- 1 Make a freehand isometric drawing of the block whose three views are shown in first angle below.

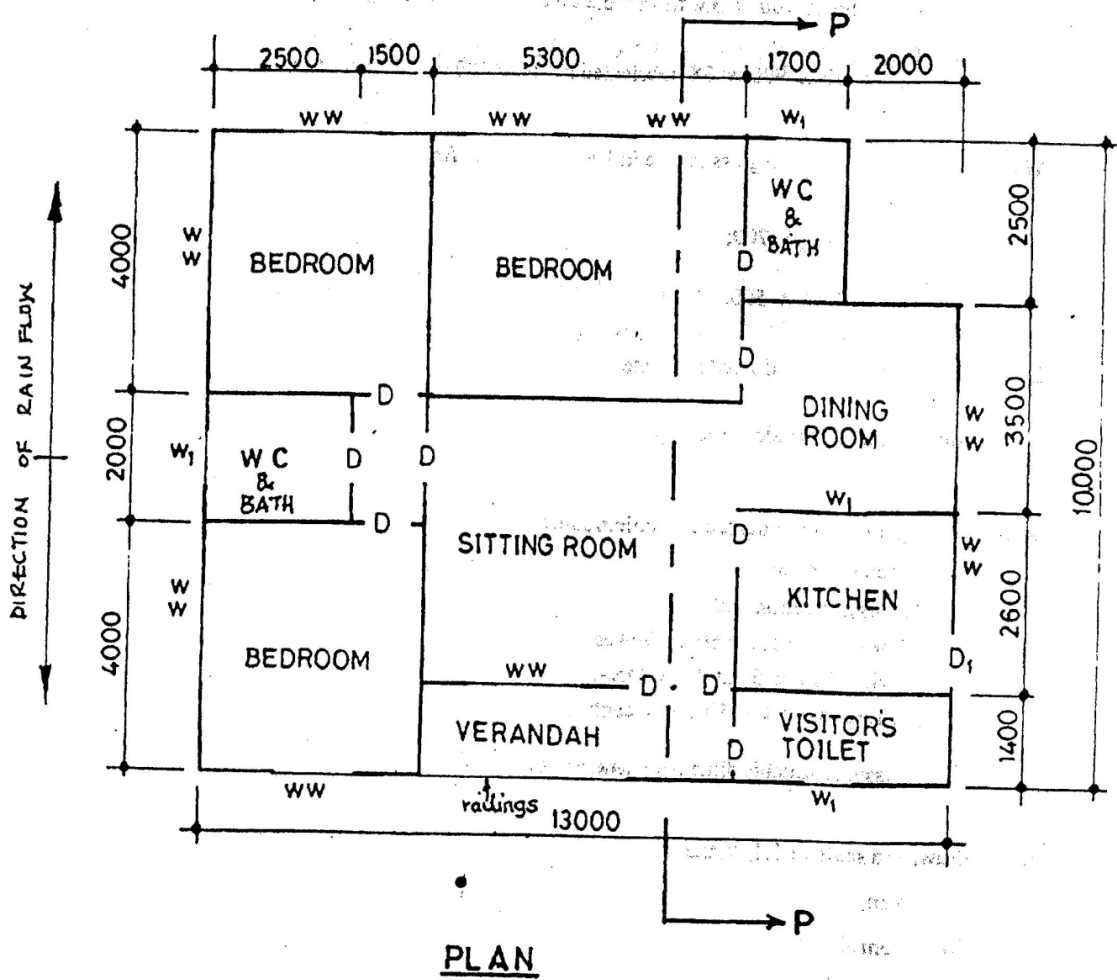
[20 marks]



- 2 (a) Make a freehand pictorial drawing of a mallet. [8 marks]
(b) Make a freehand sketching of the conventional representation of a steel. [2 marks]
- 3 (a) Make a freehand pictorial sketch of a bricklayer's trowel. [8 marks]
(b) Make a freehand sketch of the conventional representation of a wall in cross section. [2 marks]

SECTION B
Part I
 [Building Drawing (Optional)]

1. The figure below shows the sketch plan of a bungalow.
 Study the specifications and answer the questions that follow.



Foundation: 800 x 225 concrete strip at 700 below ground level.
Walls: all walls are 225 sandcrete, hollow blocks with 13 mortar rendering on both sides.
Floor: 300 hardcore; 150 concrete slab; 25 mortar screed; finished floor to ceiling 3000.
Doors: DD 2100 x 1800 x 38 panel wooden in 100 x 50 hardwood timber frame;
D – 2100 x 900 x 38 flush wooden in 100 x 50 hardwood timber frame;
D₁ – 2100 x 900 x 38 fabricated metal in 100 x 50 metal frame;
Windows: all windows are glazed louvre in 100 x 50 hardwood timber frame;
W 1200 x 700;
W₁ 800 x 500.
Lintel: 225 x 225 reinforced concrete.
Verandah: metal balustrade; 1100 high.
Roof: gable roof with corrugated aluminium sheets;
pitch angle 15°;
eaves projection 300;
timber rafter 150 x 50 at 1000 centres;
purlins 750 x 50 at 900 centres;
ceiling joist 50 x 50 at 600 centres.

(Assume suitable dimension where necessary)

- (a) Draw, to scale a of 1:100, the
 - (i) plan;
 - (ii) front elevation.

- (b) Indicate the following parts on the section:
 - (i) wallplate;
 - (ii) ceiling joist;
 - (iii) floor finish;
 - (iv) foundation footing.

Part II
[Mechanical Drawing (Optional)]

1. Three views of a machine part are given in first angle projection as shown below. Draw the:
- (a) sectional front elevation on PP;
 - (b) sectional end elevation on KK;
 - (c) plan.

