

Term 2 - 2022
DRAWING AND DESIGN (449/1)
FORM FOUR (4)
Time: 2½ Hours
Marking Scheme

Section A (50 marks)

Answer all questions in this section

1. (a) (3 marks)

- (i) Ownership
They are largely owned by the government.
 - (ii) Management
They are managed by government appointees.
 - (iii) Services
They provide subsidized services to the customers who might find it expensive to afford them if they were left to private establishments.
- (3 x 1 = 3 marks)*

2. (a)

- (i) Masking tape to hold paper
- it tends to peel off part of the paper
 - (ii) Thumb pins to hold paper
- they ruin the surface of the drawing board
- (2 x 1 = 2 marks)*

(b)

- (i) Plywood are manufactured boards made of thin sheets of wood (veneers) that are glued together with the grain of each layer perpendicular to the next.
- (ii) Chipboard is manufactured by chips of wood which are compressed and glued to the required density.
- (iii) Blockboards are made up of blocks of timber joined on edge and faced suitably with plywood on both faces.

Sketches to be accepted.

(3 x 1 = 3 marks)

3. (a). (3 marks)

- Use of the item to be fabricated or manufactured
- Availability of the material

- Durability of the material
- Cost of the material
- Weather conditions like internal or external
- Ease in the use of materials or workability

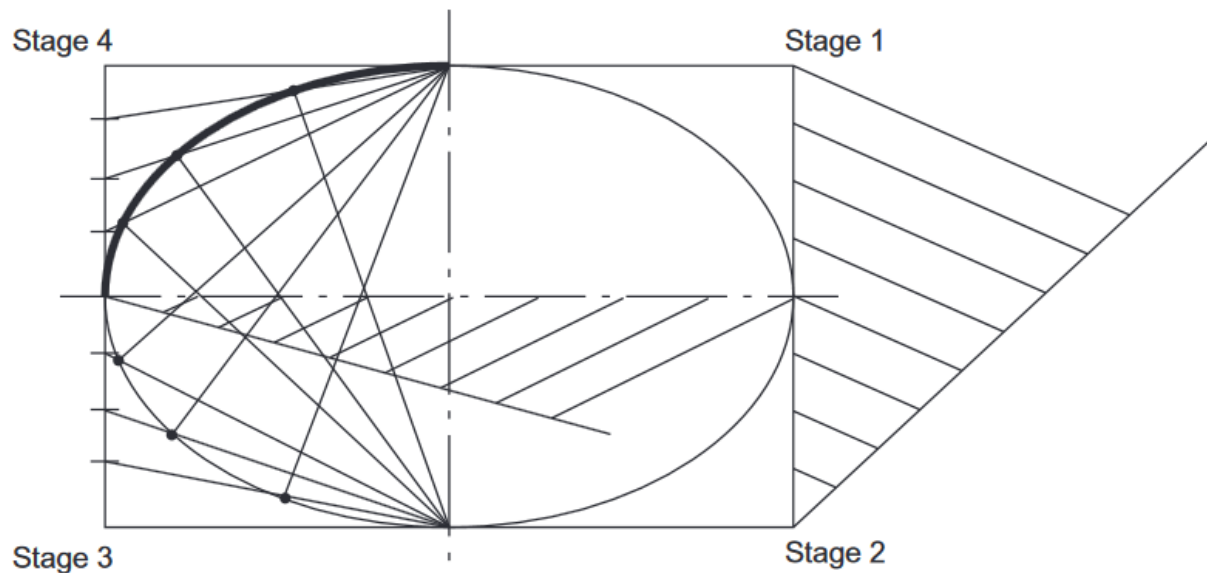
(b). Explain the meaning of the term **“alloy”** as applied in materials and give two examples (2marks)

Alloy is a metal made from two or more metals example bronze, brass, and aluminum

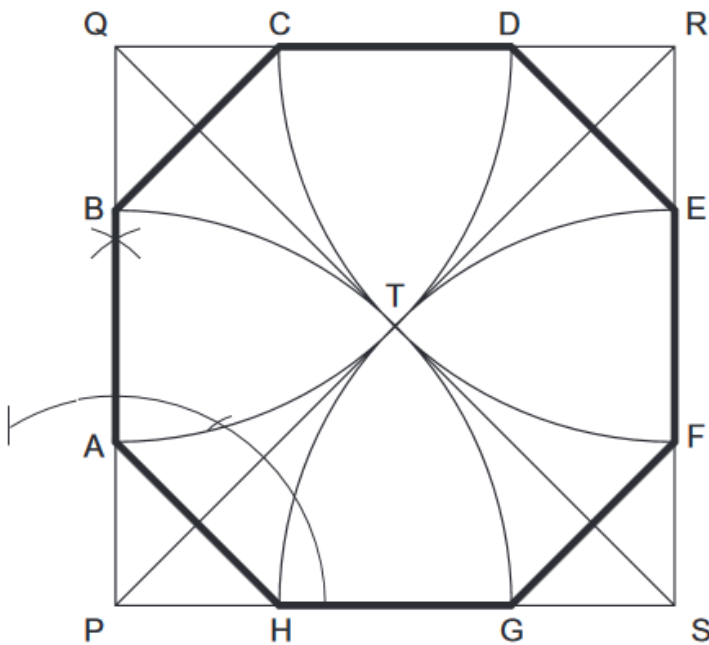
4. State the importance of following steps in the design process. (3 marks)

- a. Evaluation: Testing to see if it has satisfied the need and if not to find out where or why it has failed
- b. Final drawing: used to manufacture the real object by the craftsman.
- c. Mock-up: use to test or find out whether or not the design is satisfactory. Imperfections not seen when drawing may show up in mock-up.

5. Construct an ellipse using the rectangle method whose sides are 80mm by 45 mm. (5 marks)



6. Construct a regular octagon inside a square whose sides are 80mm. (5 marks)



1. Construct a square PQRS,
2. Draw the diagonals SQ and PR to intersect in T.
3. With centres P, Q, R and S draw four arcs. radius PT ($= QT = RT = ST$) to cut the square in A, B, C, D, E, F, G and H.

7. Two views of a machine component are shown below in **Figure 1**. Sketch the block in oblique taking **X-X** as the lowest point (6 Marks)



Fig 1

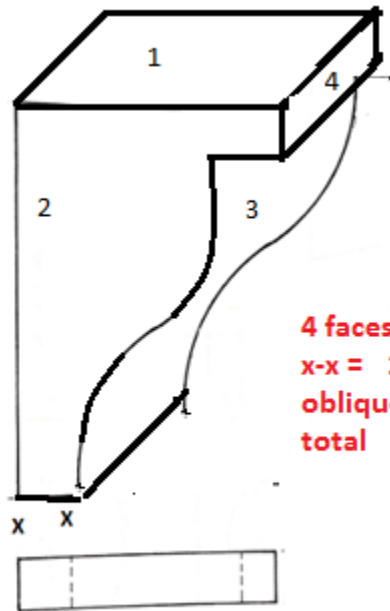
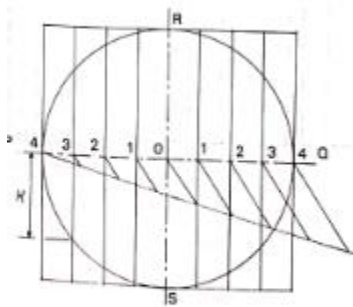


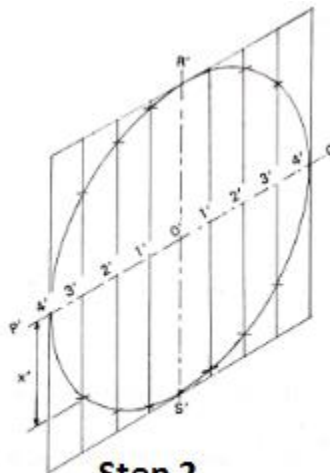
Fig 1

4 faces x 1 = 4
 x-x = 1
 oblique = 1
 total 6 marks

8. Draw an isometric circle whose diameter is 60mm using ordinate method.
 (4 marks)



Step 1



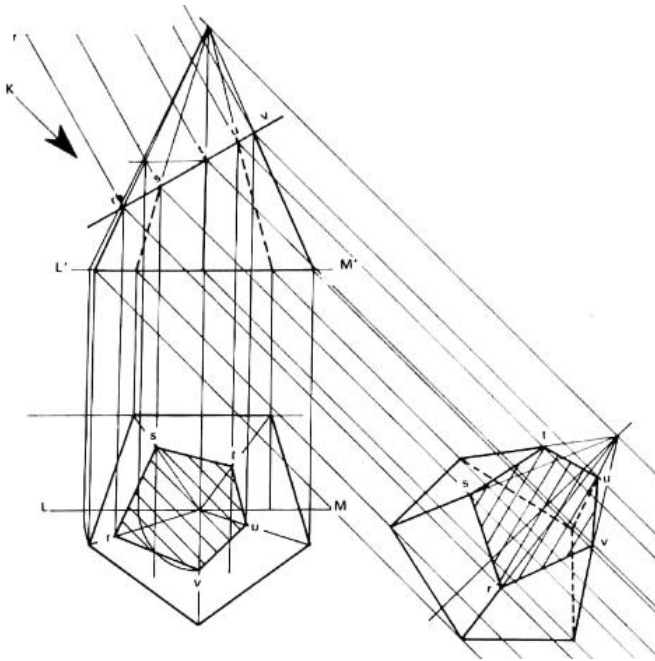
Step 2

Each step 2marks

9. Front elevation of a pentagonal pyramid truncated by the cutting plane **X_X** is given in figure 2.

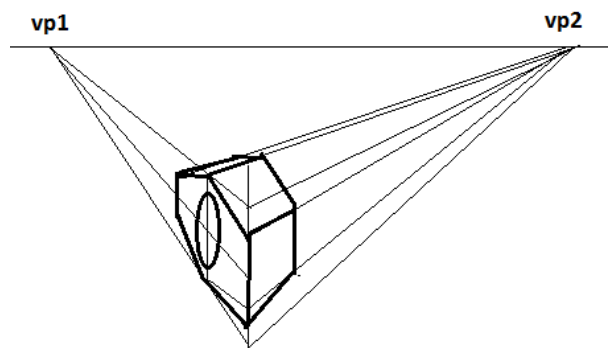
Sketch the auxiliary view and a plan.

(7 marks)



10. Two views of a machine part are shown in **figure 3**. Sketch a two point perspective of the block.

(7marks)

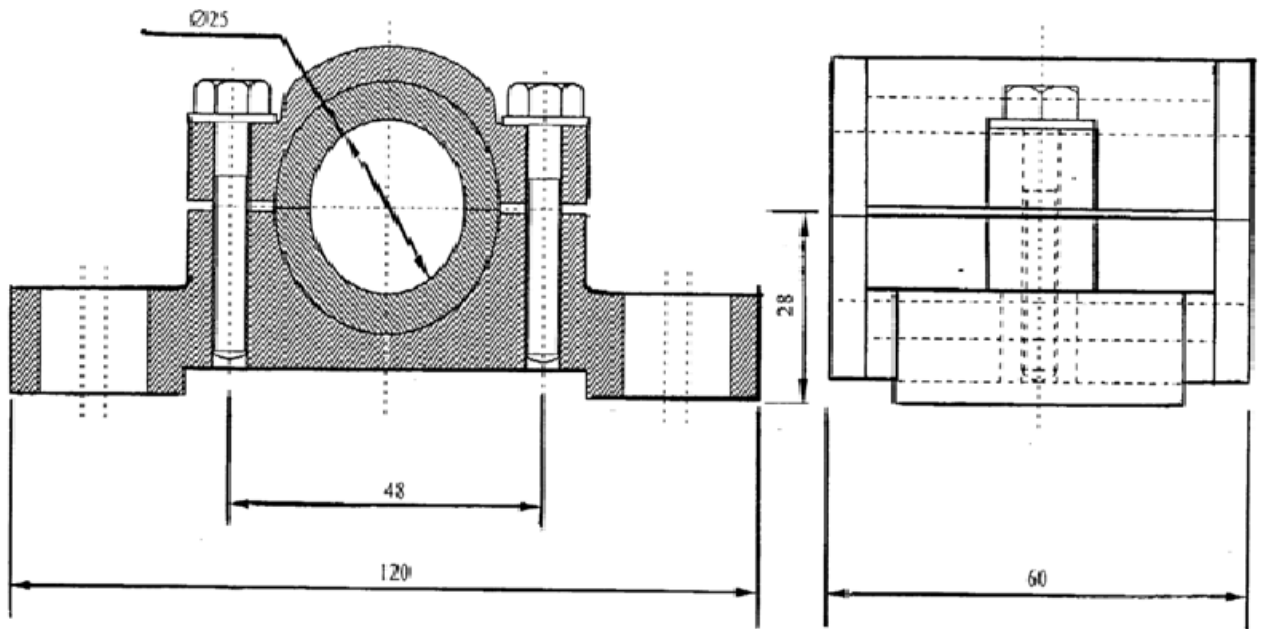


Section B (20 Marks)

This is a compulsory question.

Students are advised not to spend more than 1 hour answering this question

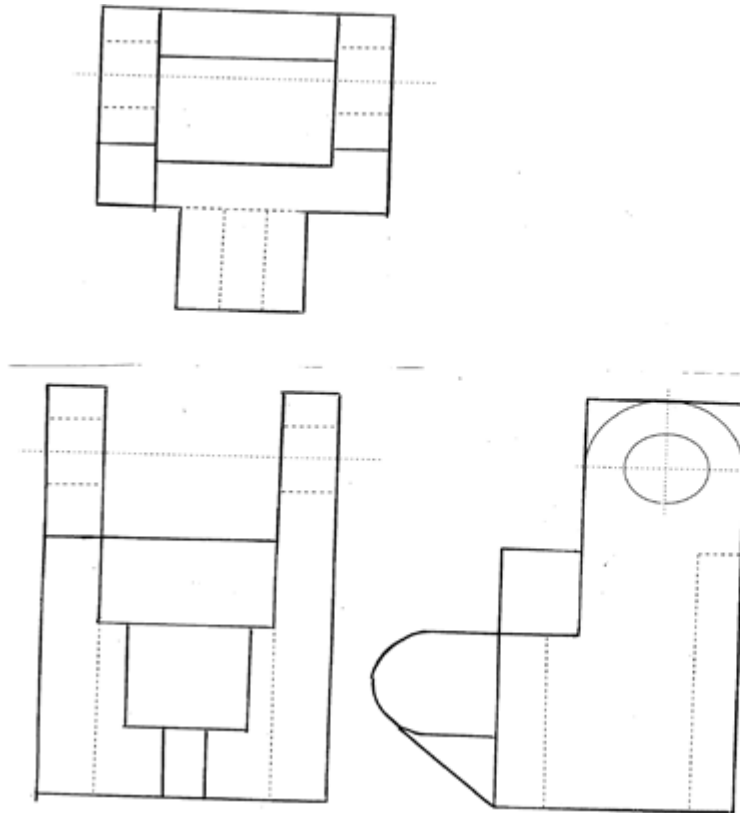
11.



Section C (30 Marks)

Answer any two questions from this section

12.



FRONT ELEVATION

6 FACES $\times \frac{1}{2}$ = 3 MARKS

CENTRELINE = 1 MARK

HIDDEN DETAILS = $2 \times \frac{1}{2}$ = 1

PLAN

6 FACES $\times \frac{1}{2}$ = 3 MARKS

CENTRE LINE $\times 1$ = 1 MARK

HIDDEN DETAILS $2 \times \frac{1}{2}$ = 1

END ELEVATION

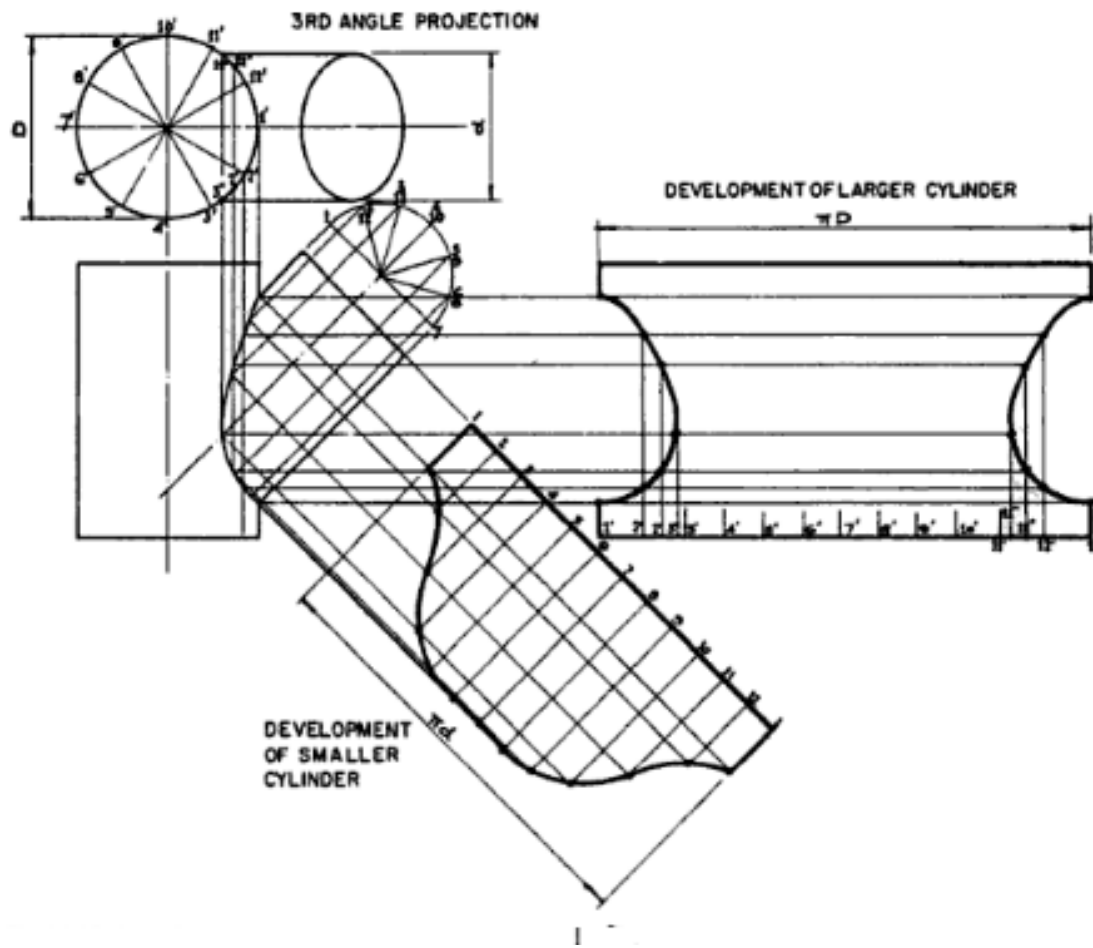
6 FACES $\times \frac{1}{2}$ = 3 MARKS

HIDDEN DETAILS $2 \times \frac{1}{2}$ = 1

3RD ANGLE = 1 MARK

TOTAL 15 MARKS

13.



14. (a) Define the term involute. (2 marks)
(b) Draw an involute to a circle of with a diameter of 30mm. (8 marks)
(c) Draw a tangent to any point T on the involute. (5 marks)

Involute: Is a curve that is obtained by attaching a string which is imaginary and then winding and unwinding it tautly on the curve given

