

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-I &II (NEW) EXAMINATION – SUMMER-2019****Subject Code: 3110013****Date: 18/06/2019****Subject Name: Engineering Graphics & Design****Time: 10:30 AM TO 01:30 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) Draw a diagonal scale of R.F, 1:5 showing decimeters, centimeters and millimeters and long enough to measure upto 8 decimeters. Show a distance of 5.35 dm. **03**
- (b) In the mechanism shown in Fig.1, the connecting rod is constrained to pass through the trunnion at D. Trace the locus of the end C and a point P on BC for one complete revolution of the crank. In Fig. 1 consider AB as 30 mm. **04**
- (c) A line AB is 100 mm long. It is inclined at  $40^\circ$  to the HP and  $30^\circ$  to the VP. The end A is 10 mm above HP and 25 mm in front of VP. Assuming the end B in the first quadrant, draw the projections of the line AB. **07**
- Q.2**
- (a) Explain the following autocad commands : hatch, circle and array. **03**
- (b) Explain the following autocad commands : mirror, trim, extend and fillet. **04**
- (c) A triangle ABC has sides AB = 75 mm, BC = 60 mm and CA = 75 mm. Draw a parabola passing through points A, B and C when side BC is horizontal. **07**
- OR**
- (c) Draw an epicycloid with rolling circle diameter 50 mm and directing circle diameter 150 mm. Draw tangent and normal at a point on the curve 110 mm from the centre of the directing circle. **07**
- Q.3**
- (a) Define the following curves : involute, ellipse and cycloid. **03**
- (b) The distance between the end projectors of a straight line AB is 60 mm. Point A is 5 mm above HP and 30 mm in front of VP. Point B is 40 mm above HP and 50 mm behind VP. Draw the projections and find the inclination of straight line AB with HP and VP and the true length of the line. **04**
- (c) An isosceles triangular plate of 50 mm base and 75 mm altitude, appears as an equilateral triangle of 50 mm in top view. Draw the projections of a plate if its 50 mm long edge is on the HP and inclined at  $45^\circ$  to the VP. What is the inclination of the plate with the HP ? **07**
- OR**
- Q.3**
- (a) Draw the projections of the following points on the same x-y line : **03**
- (i) Point A is 20 mm above the HP and 20 mm behind the VP.
- (ii) Point B is 40 mm above HP and 10 in front of VP.
- (iii) Point C is 25 mm below HP and 40 mm behind VP.
- (b) Two lemons on a tree, planted near the compound wall of a bungalow are 1.0 m and 1.25 m above the ground and 0.5 m and 0.75 m from a 15 cm thick compound wall but on opposite sides of it. The distance between lemons measured along the ground and parallel to the wall is 1.0 m. Determine the real distance between the centres of two lemons. **04**

- (c) ABCDE is a regular pentagonal plate of 40 mm sides, has its corner A on the HP. The plate is inclined to the HP such that the plan length of the edges AB and AE is each 35 mm. The side CD is parallel to both the reference planes. Draw the projections of the plate and find its inclination with the HP. **07**
- Q.4** (a) Draw the projections of a cone, base 60 mm diameter and axis 90 mm long when it is resting on the HP on a point on its base circle with the axis making an angle of  $30^\circ$  with the HP and parallel to the VP. **03**
- (b) Fig.2 shows the front view of a cut hexagonal pyramid. Draw the development of the lateral surface of the remaining portion of the pyramid. **04**
- (c) A cylinder is resting on HP on its base. It is cut by AVP perpendicular to HP and inclined to VP by  $45^\circ$  and cutting it remaining 12 mm away from the axis. Draw the projections with section and draw also the true shape of the section. Take diameter of cylinder 55 mm and height 60 mm. **07**
- OR**
- Q.4** (a) Differentiate between **03**
- (i) Prism and pyramid
- (ii) Square pyramid and tetrahedron
- (iii) Cube and square prism
- (b) Draw the plan and elevation of a cone resting on HP on its base. Show on them the shortest path followed by a fly moving around the cone and returning to the same starting point. Fly starts from a point on the periphery of base. Take base diameter of cone 80 mm and height of axis 90 mm. **04**
- (c) A cone of 70 mm diameter of the base circle and 60 mm length of axis is resting on its base on the HP. It is cut by an AIP so that true shape of the section is an isosceles triangle with the vertex angle of  $50^\circ$ . Set the required cutting plane and find its inclination with the HP. Draw sectional top view, front view and project the true shape of the section. **07**
- Q.5** (a) Differentiate between aligned system and unidirectional system of dimensioning. **03**
- (b) Using third angle projection method draw right hand side view for the object shown in Fig. 3. **04**
- (c) Using third angle projection method draw front view and top view for the object shown in Fig. 3. **07**
- OR**
- Q.5** (a) A circular plate, 50 mm diameter is resting on HP on one of the points of its periphery with surface of the plate perpendicular to VP and inclined to HP by  $30^\circ$ . Draw two projections of the circular plate. **03**
- (b) Draw isometric view from the orthographic projection shown in Fig. 4. **11**

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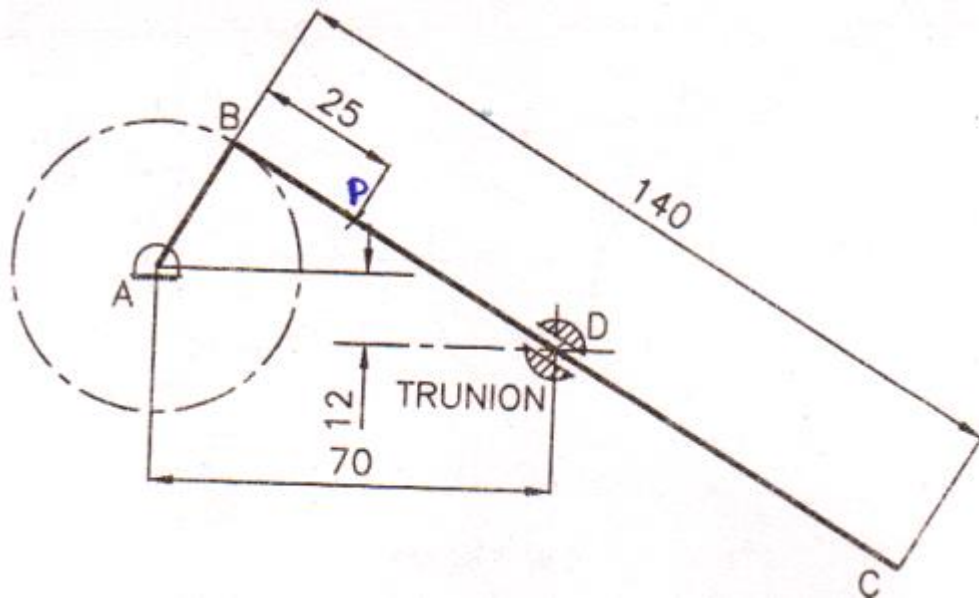


Fig. 1

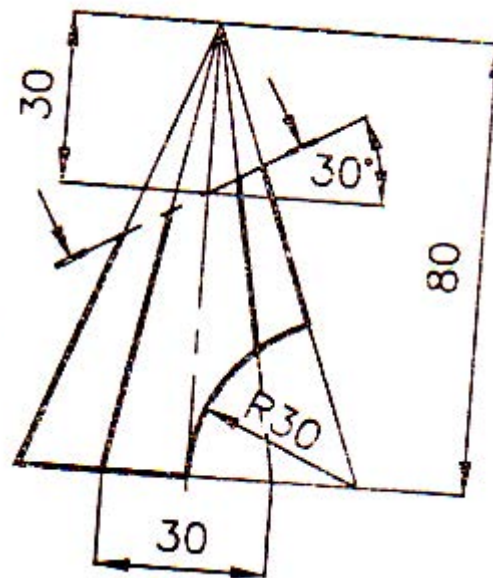


Fig.2

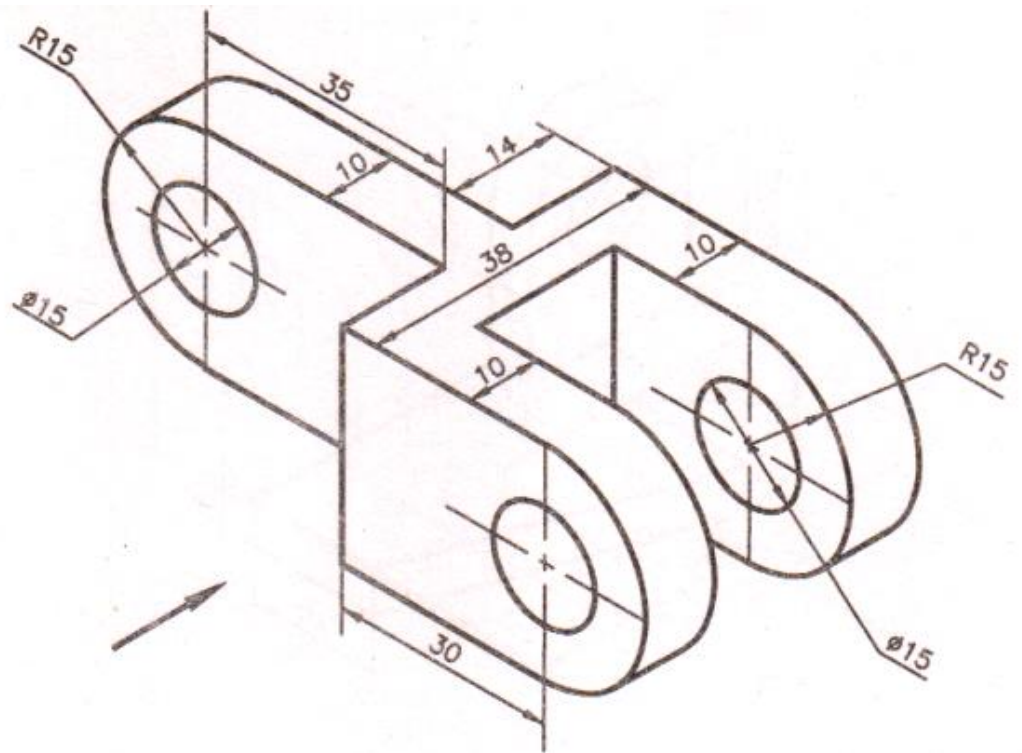


Fig.3

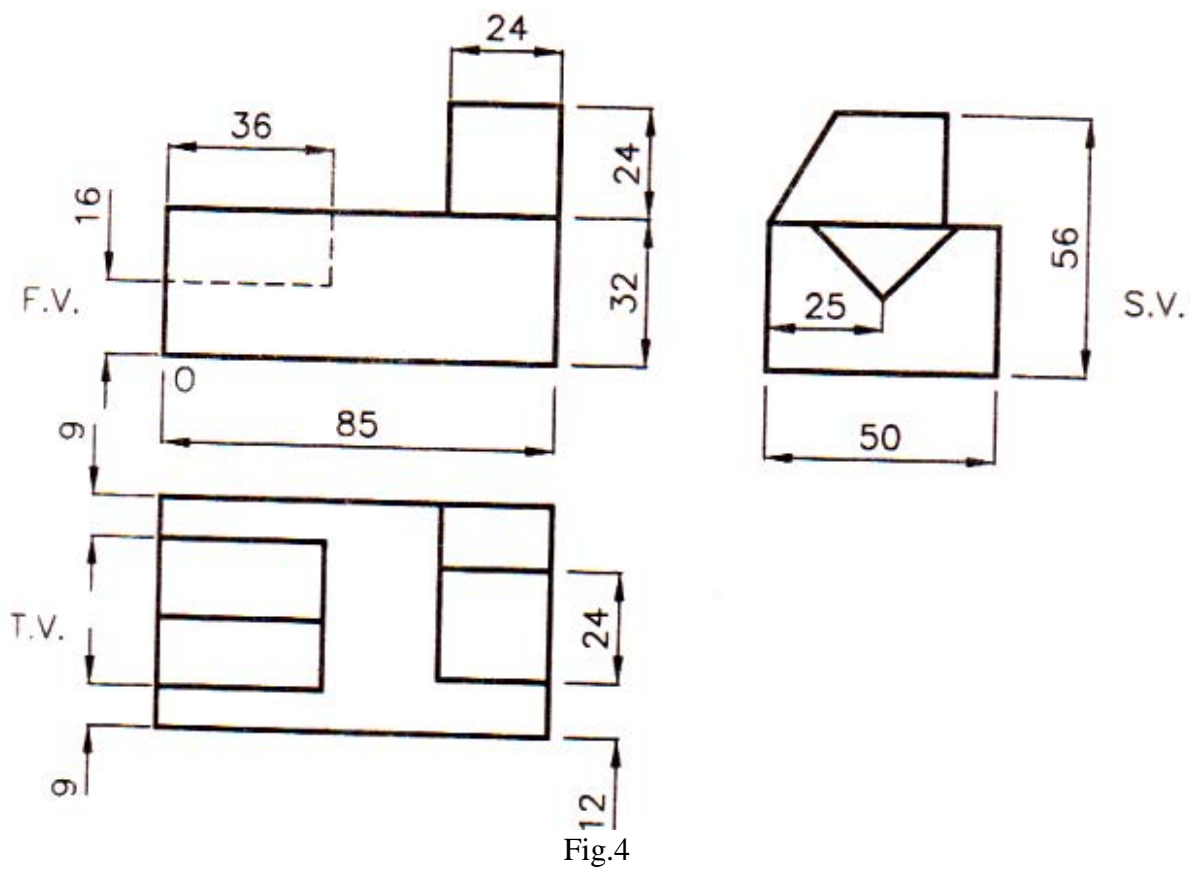


Fig.4

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