Hall Ticket No | | | | | | | | | | |  Question Paper Code: AME001

# INSTITUTE OF AERONAUTICAL ENGINEERING

**(Autonomous)**

**Dundigal, Hyderabad - 500 043**

## MODEL QUESTION PAPER

B.Tech I Semester End Examinations (Regular), November – 2017

**Regulations: IARE-R16**

## ENGINEERING DRAWING
## (Common to AE / ME / CE)

**Time: 3 hours** **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

### UNIT – I

1 a) A circle of 40 mm diameter rolls on the concave side of another circle of 40 mm radius. Draw the path traced by a point on the generating circle for one complete revolution. Name the curve and draw a normal and tangent to the curve at any point. **[7M]**

b) On a map, the distance between two points is 140 mm. The real distance between them is 20 Km. Draw a diagonal scale of this map to read Kilometers and Hectometers, and to measure up to 25 Km. Show a distance of 5.27 Km on this scale. **[7M]**

2 a) Construct an ellipse when the distance of the focus from the directrix is equal to 60 mm and eccentricity 2/3. Also, draw a normal and a tangent to the curve at a point 35 mm from the focus. **[7M]**

b) An inelastic string 160 mm long has its end attached to the circumference of a circular disc of 40 mm diameter. Draw the curve traced out by the other end of the string when it is completely wound round the disc, keeping the string always tight. Name the curve and draw a normal and tangent to the curve at any point. **[7M]**

### UNIT – II

3 a) Draw the projections of the following points, keeping the projectors 25 mm apart: **[7M]**
P- in the H.P and 25 mm behind V.P.
Q- 45 mm above H.P and 30 mm in front of V.P.
R- in the V.P. and 50 mm above H.P.
S- 30 mm below H.P. and 35 mm behind V.P.
T- in both H.P and V.P.

b) A line AB 75 mm long is inclined at $45^0$ to the HP and $30^0$ to VP. Its end B is in the HP and 40 mm infront of the VP. Draw its projections and determine traces. **[7M]**

4 a) A line AB of 70 mm long has its end A at 10 mm above HP and 15 mm in front of VP. Its front view and top view measures 50 mm and 60 mm respectively. Draw the projections of the line and determine its inclinations with HP and VP. **[7M]**

b) A pentagonal plane of 30mm side has one of its sides in the V.P. and inclined at $60^0$ to the H.P. while the surface of the plane makes an angle of $40^0$ with V.P. Draw its projections. **[7M]**

**UNIT – III**

5 a) Draw the projection of a cone, base 75 mm diameter and axis 100 mm long, lying on H.P. on one of its generators with axis parallel to the V.P. **[7M]**

b) A square prism base 40 mm side and height 65 mm has its axis inclined at $45^0$ to HP and has an edge of its base on the HP and inclined at $30^0$ to VP. Draw its projections. **[7M]**

6 a) A square pyramid of base edge 30 mm and altitude 40mm has one of its slant faces in the V.P and the edge of the base contained by that face is inclined at 45° to the H.P. Draw the projections of the pyramid when the vertex is in the H.P. **[7M]**

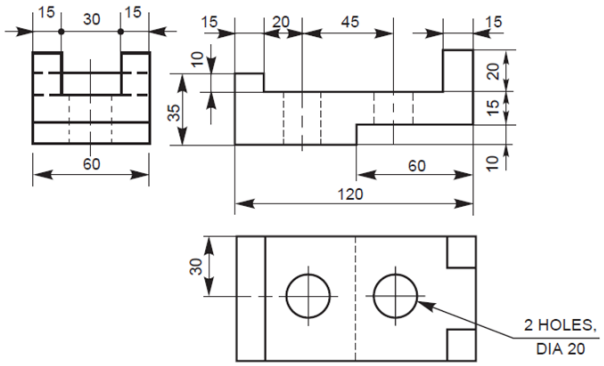
b) A cylindrical block, 70 mm diameter and 30 mm thick, has a hexagonal hole of 25 mm side, cut centrally through its flat faces. Draw the projections of the block when it has its flat faces vertical and inclined at $45^0$ to the V.P. and two faces of the hole parallel to H.P. **[7M]**

**UNIT – IV**

7 a) A cube of 40 mm edge stands on one of its faces on H.P. with a vertical face making $45^0$ to the V.P. A horizontal hole of 30 mm diameter is drilled centrally through the cube such that the hole passes through the opposite vertical edges of the cube. Obtain the development of the lateral surface of the cube with the hole. [**7M**]

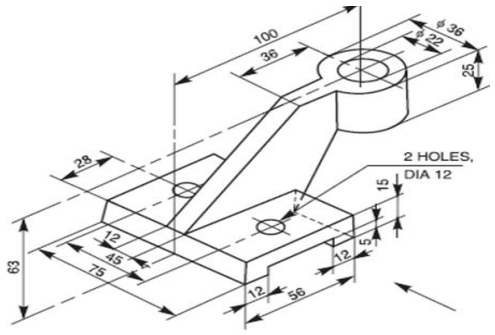
b) A pentagonal prism of 30 mm base side and height 65 mm is resting on its base on HP, such that one of its base edges is parallel and near to VP. A section plane passes through a point on the axis 30 mm above the HP and is inclined at $45^0$ to HP. Draw the development of the lateral surface of the truncated prism **[7M]**

8 Draw the isometric view of the figure given below. (All dimensions are in mm). **[14M]**

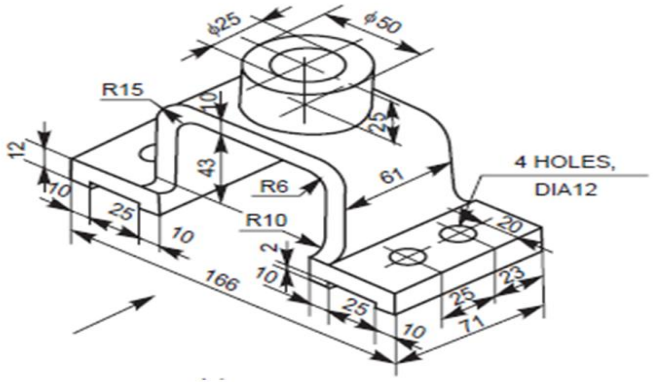


## UNIT – V

9. Draw the elevation, plan and side view from the right of the object whose isometric view is shown in the figure below (All dimensions are in mm). **[14M]**




10 Draw the front view, top view and side view of the object whose isometric view is shown in the figure below (All dimensions are in mm). **[14M]**



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## COURSE OBJECTIVES:

**The course should enable the students to:**

| | |
|---|---|
| I | Understand the basic principles of engineering drawing and construction of curves used in engineering field. |
| II | Apply the knowledge of interpretation of projection in different quadrants. |
| II | Understand projection of solids when it is inclined to both the planes. |
| IV | Convert the pictorial views into orthographic views and vice-versa. |
| V | Create intricate details of components through sections and develop its surfaces. |

## COURSE OUTCOMES:

**Students, who complete the course, will have demonstrated the ability to do the following:**

| S. No. | Description | Blooms Taxonomy Level |
|---|---|---|
| CAME001.01 | Understand the BIS conventions of engineering drawing with basic concepts, ideas and methodology. | Understand |
| CAME001.02 | Recognize the need of single stroke lettering in defining the components. | Understand |
| CAME001.03 | Understand the different line types according to BIS standards to Engineering drawings. | Remember |
| CAME001.04 | Sketch the various types of polygons for applying in solid modeling. | Understand |
| CAME001.05 | Discuss the various types of scales for engineering application like maps, buildings, bridges. | Understand |
| CAME001.06 | Visualize parabolic and elliptical profiles in buildings and bridges | Understand |
| CAME001.07 | Visualize cycloidal and involute profiles in developing new products like gears and other engineering applications. | Remember |
| CAME001.08 | Solve specific geometrical problems in plane geometry involving points and lines. | Understand |
| CAME001.09 | Understand the theory of projection in planes located in various quadrants and apply in manufacturing processes. | Remember |
| CAME001.10 | Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design. | Understand |
| CAME001.11 | Apply the terminology of development of surfaces in the area of chimneys and chutes. | Remember |
| CAME001.12 | Visualize the components by isometric projection by representing three-dimensional objects in two dimensions in technical and engineering drawings. | Remember |
| CAME001.13 | Interpret plumbing drawings typically found in construction by using transformation of projection. | Understand |
| CAME001.14 | Convert the orthographic views into pictorial views by using transformation of projection. | Remember |
| CAME001.15 | Convert the pictorial views into orthographic views by using transformation of projection. | Understand |

## MAPPING OF MODEL QUESTION PAPER QUESTIONS TO THE ACHIEVEMENT OF COURSE LEARNING OUTCOMES

| SEE Question No. | | Course Outcomes | | Bloom's Taxonomy |
|---|---|---|---|---|
| 1 | a | CAME001.07 | Visualize cycloidal and involute profiles in developing new products like gears and other engineering applications. | Remember |
| | b | CAME001.05 | Discuss the various types of scales for engineering application like maps, buildings, bridges. | Understand |
| 2 | a | CAME001.06 | Visualize parabolic and elliptical profiles in buildings and bridges | Understand |
| | b | CAME001.07 | Visualize cycloidal and involute profiles in developing new products like gears and other engineering applications. | Remember |
| 3 | a | CAME001.08 | Solve specific geometrical problems in plane geometry involving points and lines. | Understand |
| | b | CAME001.08 | Solve specific geometrical problems in plane geometry involving points and lines. | Understand |
| 4 | a | CAME001.08 | Solve specific geometrical problems in plane geometry involving points and lines. | Understand |
| | b | CAME001.09 | Understand the theory of projection in planes located in various quadrants and apply in manufacturing processes. | Remember |
| 5 | a | CAME001.10 | Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design. | Understand |
| | b | CAME001.10 | Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design. | Understand |
| 6 | a | CAME001.10 | Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design. | Understand |
| | b | CAME001.10 | Understand the orthographic projection concepts in solid modeling and apply the concepts in the areas of design. | Understand |
| 7 | a | CAME001.11 | Apply the terminology of development of surfaces in the area of chimneys and chutes. | Remember |
| | b | CAME001.11 | Apply the terminology of development of surfaces in the area of chimneys and chutes. | Remember |
| 8 | - | CAME001.12 | Visualize the components by isometric projection by representing three-dimensional objects in two dimensions in technical and engineering drawings. | Remember |
| 9 | - | CAME001.15 | Convert the pictorial views into orthographic views by using transformation of projection. | Understand |
| 10 | - | CAME001.15 | Convert the pictorial views into orthographic views by using transformation of projection. | Understand |

**Signature of Course Coordinator** **HOD, Mechanical Engineering**