



# Vel Tech Multi Tech

Dr.Rangarajan Dr.Sakunthala Engineering College

An Autonomous Institution

## Department of Mechanical Engineering

191ME112 – Engineering Graphics

Question Bank (2022-2023)

COURSE CODE	COURSE NAME	L	T	P	C
191ME112	ENGINEERING GRAPHICS	2	2	0	3
<b>COURSE OBJECTIVES</b>					
<ul style="list-style-type: none"> <li>To convey the basics of engineering drawing of curves and concepts of free hand sketching</li> <li>To teach different methods of making views of simple objects resembling points, lines and surfaces</li> <li>To relate the visualizations of simple solid objects as per principles of orthographic projection</li> <li>To establish the importance of sections and developments made in drawing</li> <li>To develop an intuitive understanding of underlying significance of using pictorial drawings</li> </ul>					
<b>CONCEPTS AND CONVENTIONS (Not for Examination)</b>					
Introduction to engineering graphics- Importance of graphics in engineering applications – Use of drafting instruments -Size and layout of drawing sheets. BIS Standards - Lettering and dimensioning.					
<b>UNIT 1</b>	<b>PLANE CURVES AND FREE HAND SKETCHING</b>	<b>12</b>			
Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves. Visualization concepts and Free Hand sketching: Visualization principles –Representation of Three Dimensional objects – Layout of views-Free hand sketching of multiple orthographic views from single pictorial view of objects.					
<b>UNIT 2</b>	<b>PROJECTION OF POINTS, LINES AND PLANE SURFACES</b>	<b>12</b>			
Orthographic projections - Introduction - Principles -Principal planes-First angle projection. Projection of points located in all quadrants. Projection of straight lines inclined to both the principal planes, Determination of true lengths and true inclinations by rotating line method, traces. Projection of planes (regular polygonal and circular surfaces) inclined to both the principal planes by rotating object method.					
<b>UNIT 3</b>	<b>PROJECTION OF SOLIDS</b>	<b>12</b>			
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method.					
<b>UNIT 4</b>	<b>SECTION OF SOLIDS &amp; DEVELOPMENT OF LATERAL SURFACE OF SOLIDS</b>	<b>12</b>			
Sectioning of simple solids in vertical position when the cutting plane is inclined to one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids like Prisms, pyramids, cylinders and cones.					
<b>UNIT 5</b>	<b>ISOMETRIC AND PERSPECTIVE PROJECTIONS</b>	<b>12</b>			
Principles of isometric projection – Isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, and cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids like Prisms, pyramids and cylinders by visual ray method.					
<b>TOTAL: 60 PERIODS</b>					
<b>REFERENCES</b>					
<ol style="list-style-type: none"> <li>N.D. Bhatt, Engineering Drawing, 49th edition, Charotar Publishing House, 2006.</li> <li>Natarajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.</li> <li>Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.</li> <li>Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.</li> <li>Gopalakrishna K.R., "Engineering Drawing" (Vol. I&amp;II combined), Subhas Stores, Bangalore, 2007.</li> </ol>					

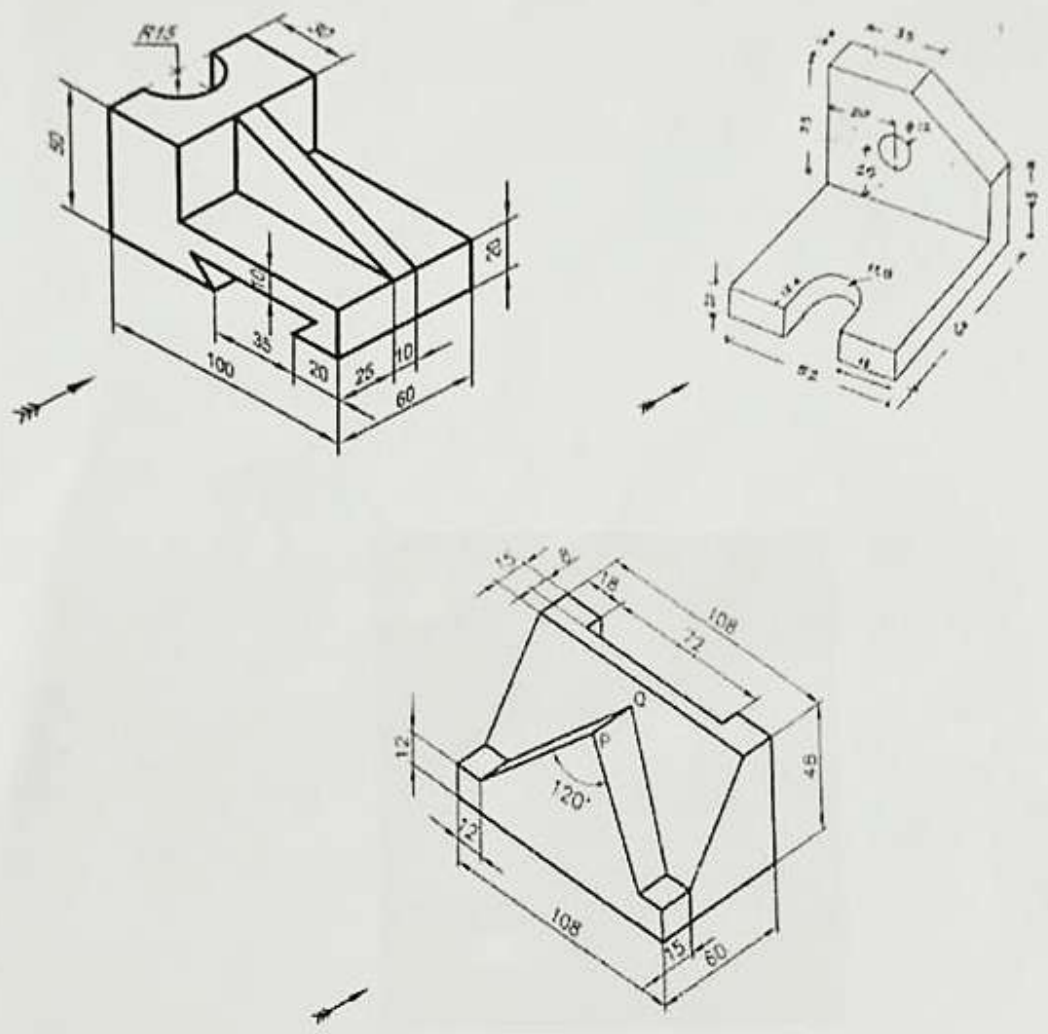


**UNIT-1 PLANE CURVES AND FREE HAND SKETCHING**

Sl. No	Questions	CO	K Level
1.	Draw the ellipse when the distance of focus from the directrix is equal to 35 mm and eccentricity is $\frac{2}{3}$ . Draw the tangent and normal at any point on the curve.	CO1.1	K3
2.	Draw the locus of a point P which moves in a plane such that the ratio of its distances from a fixed point F and a fixed straight line AB is always $\frac{2}{3}$ . <b>The distance between the fixed point F and vertex is 20 mm.</b> Also draw a tangent and normal on a point on the locus at a horizontal distance of 30 mm from the fixed straight line.	CO1.1	K5
3.	Draw a parabola when the distance of focus from the directrix is equal to 40 mm. Draw the tangent and normal at any point on the curve.	CO1.2	K3
4.	A <b>stationary heavenly body</b> of huge mass is located at a distance of 50 km from a fixed straight line. Draw the locus of one of its <b>satellites</b> moving in such a way that the distance from the fixed straight line is equal to its distance from the heavenly body. Draw and name the curve obtained by tracing the path of the satellite.	CO1.2	K5
5.	Draw a hyperbola when the distance of focus from the directrix is equal to 50 mm and eccentricity is $\frac{3}{2}$ . Draw the tangent and normal at a point 30 mm above the axis on the curve.	CO1.3	K4
6.	The vertex and the focus of a conic curves is at a distance of 20 mm and 50 mm respectively from a fixed straight line. Draw the tangent and normal at any point on it.	CO1.3	K4
7.	A coin of 40 mm diameter rolls over a horizontal table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Draw the path traced by the point. Draw a tangent and normal at any point on the curve.	CO1.4	K4
8.	A circle diameter 60 mm rolls on a horizontal line for 75% of a revolution clockwise. Draw the path traced by a point p on the circumference of the circle. Also draw a tangent and normal at any point on the curve.	CO1.4	K4
9.	Draw the involute of a circle of diameter 40 mm. Also draw the tangent and normal at any point on the curve.	CO1.5	K3
10.	<b>An inelastic string of length 100 mm is wound</b> round a circle of diameter 26 mm. Draw the path traced by the end of the string. Also draw a tangent and normal at any point on the curve.	CO1.5	K5
11.	Draw the involute of a square of sides 25 mm. Also draw the tangent and normal at any point on the curve.	CO1.5	K3

12- Draw the front view, top view and the right side view for the following figures.  
 14.

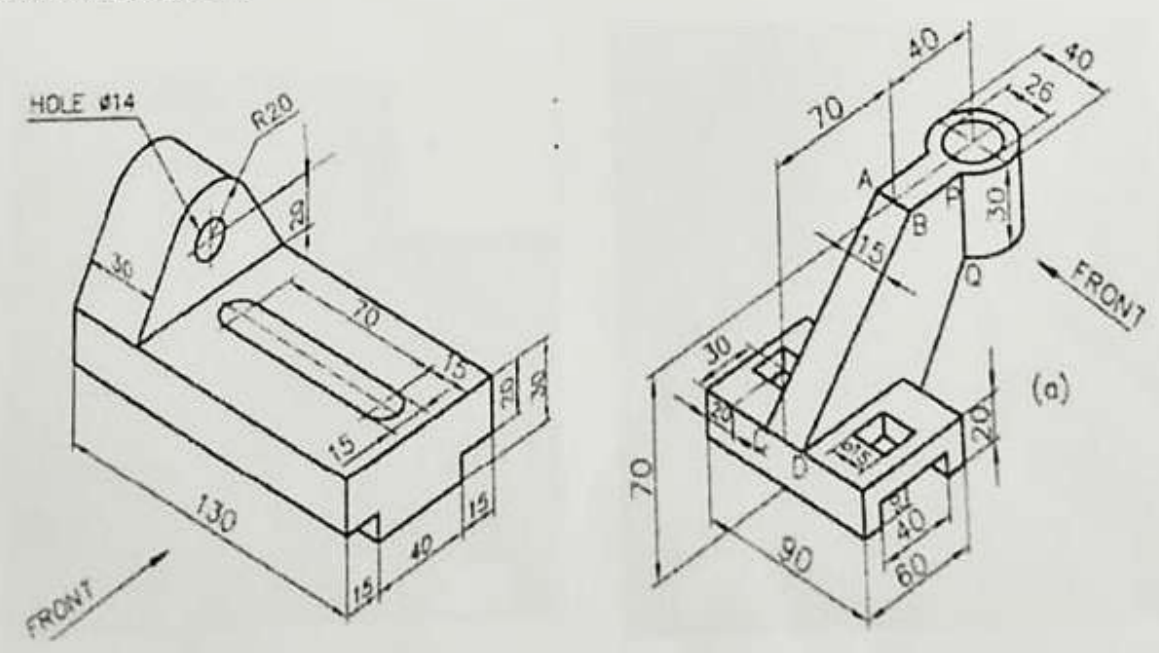
CO1.6 K4



NOTE: ALL DIMENSIONS ARE IN "mm"

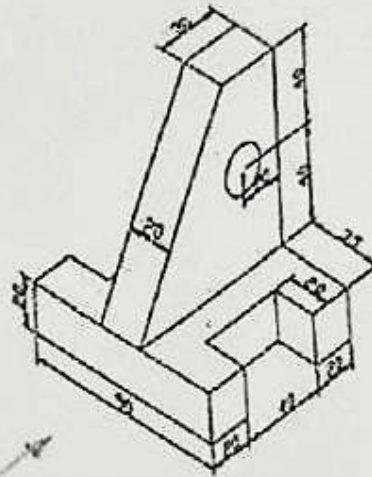
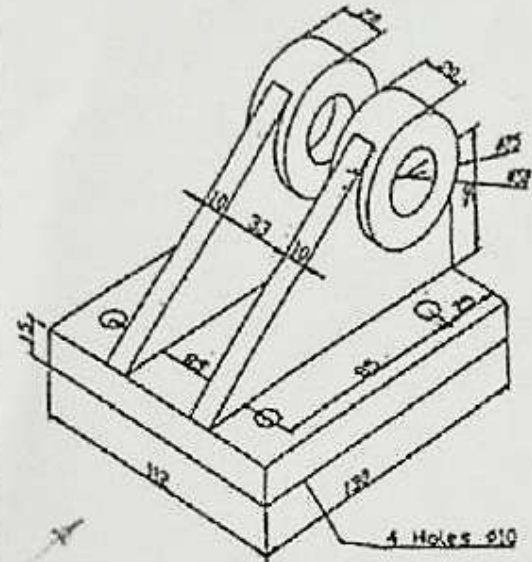
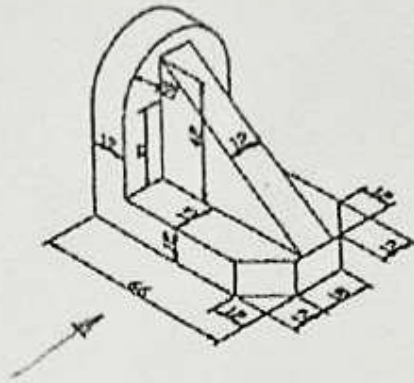
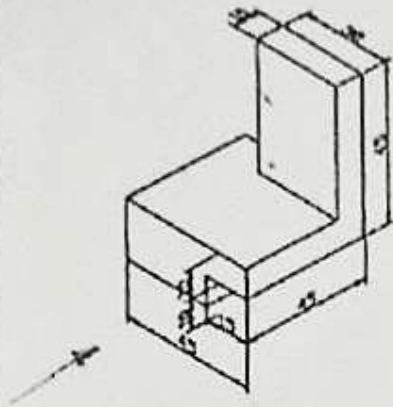
15- Draw the front view, top view, right side view and left side view for the  
 20. following figures.

CO1.6 K5



NOTE: ALL DIMENSIONS ARE IN "mm"





NOTE: ALL DIMENSIONS ARE IN "mm"