

VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur– 603 203

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTIONBANK



**I SEMESTER
GE 8152-ENGINEERING GRAPHICS**

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SUBJECT : GE 8152 - ENGINEERING GRAPHICS

SEM / YEAR : I / I

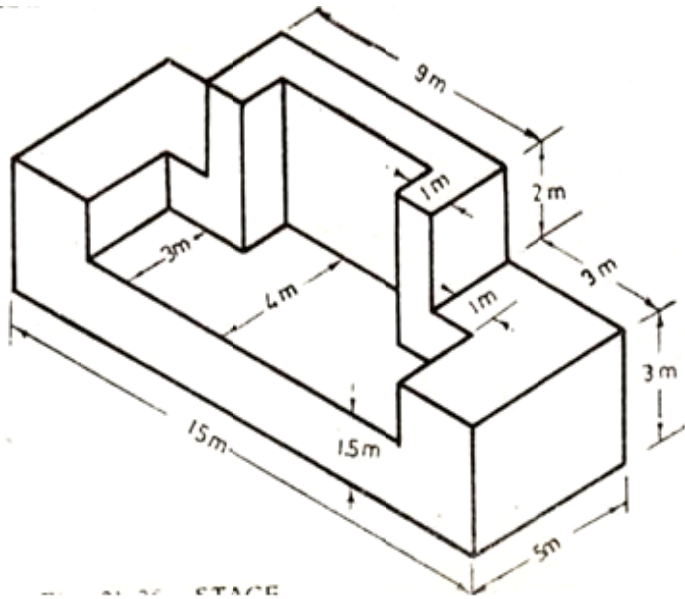
UNIT I PLANE CURVES AND FREE HAND SKETCHING

Basic Geometrical constructions, Curves used in engineering practices: 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 views from pictorial views of objects

Q. No	Questions	BT Level	Competence
1	Construct a parabola when the distance between the focus and directrix is 50mm. Also draw the tangent and normal to any point on the curve. (20)	(BT-6)	Create
2	Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is $5/4$. Also draw the tangent and normal to any point on the curve. (20)	(BT-6)	Create
3	Draw the locus of a point P which moves in a plane in such a way that the ratio of its distances from a fixed point F and fixed straight line AB is always $2/3$. The distance between the fixed point F and fixed straight line is 50mm. also draw a tangent and normal on a point on the locus at a horizontal distance of 55 mm from the fixed straight line. (20)	(BT-6)	Create
4	Construct a cycloid given the radius of the generating circle is 30 mm. Also draw a tangent and normal at any point on the cycloid.(20)	(BT-6)	Create
5	Construct a cycloid for one and half revolutions when the radius of the generating circle is 25 mm.(20)	(BT-6)	Create
6	Construct an Epicycloid of a circle 50 mm diameter which rolls outside of another circle of 150 mm diameter for one revolution. Draw tangent and normal to any point on the curve. (20)	(BT-6)	Create
7	A circus animal rides small motor bike inside a globe of 200mm diameter. the motor bike has the wheel of 40mm diameter. Draw the locus of the point on the circumference of the motor-bike for one complete revolution. (20)	(BT-6)	Create
8	A coir is unwound from a drum of 50 mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of 360° . Also draw normal and tangent at any point on the curve.(20)	(BT-6)	Create

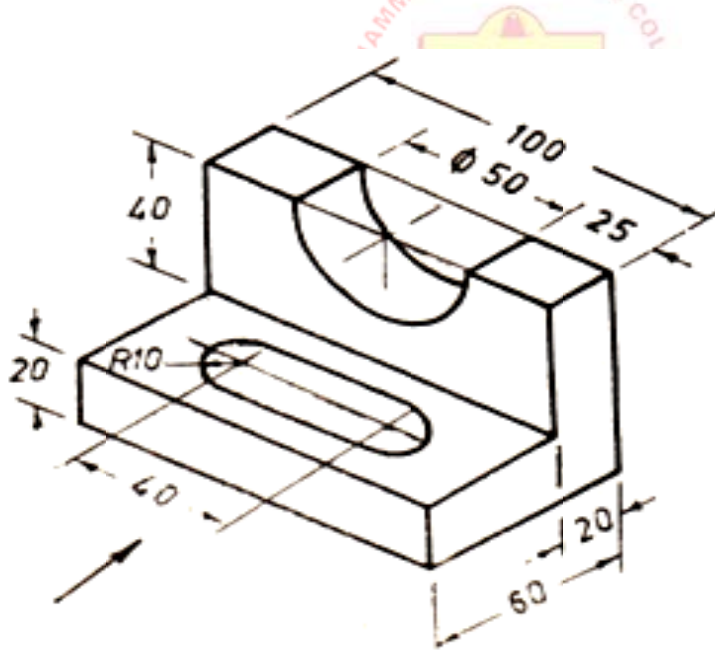
9 Draw the front , top and side view of the given image. (20)

(BT-6) Create



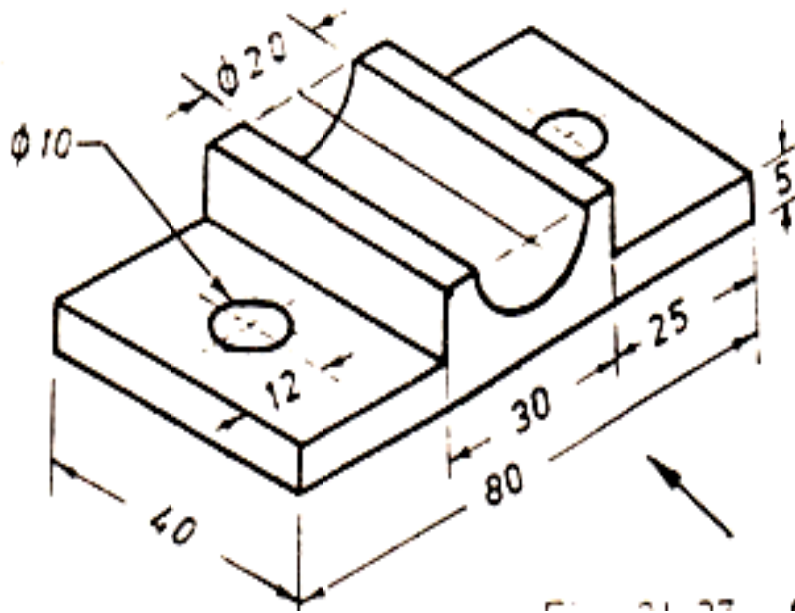
10 Draw the front , top and side view of the given image. (20)

(BT-6) Create



11 Draw the front , top and side view of the given image. (20)

(BT-6) Create



12 Draw the front , top and side view of the given image. (20)

(BT-6) Create

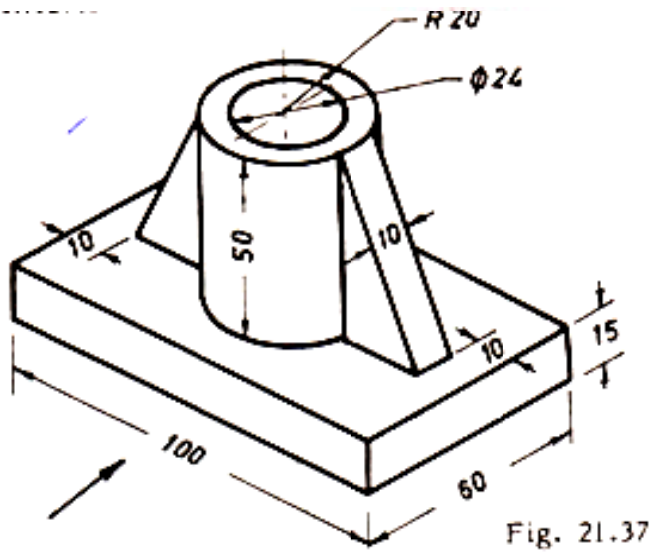
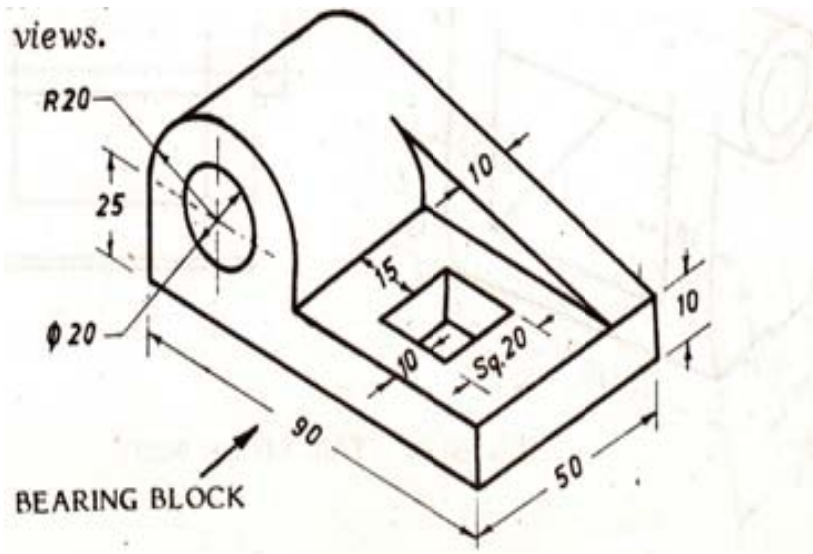


Fig. 21.37

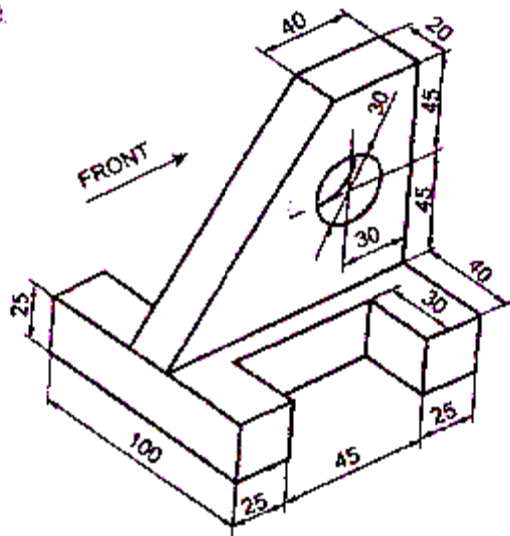
13 Draw the front , top and side view of the given image. (20)

(BT-6) Create



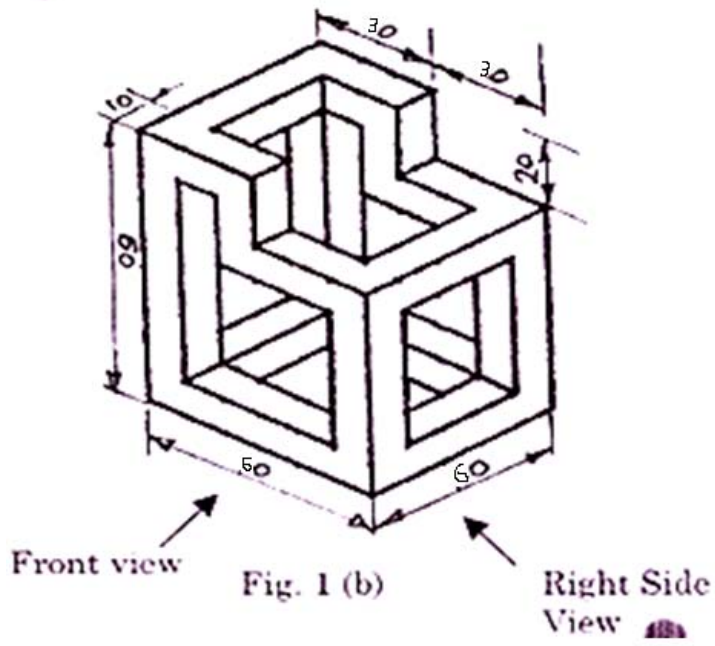
14 Draw the front , top and side view of the given image. (20)

(BT-6) Create



15 Draw the front , top and side view of the given image. (20)

(BT-6) Create



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UNIT II-PROJECTION OF POINTS, LINES AND PLANE SURFACES

Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces- Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

Q. No	Questions	BT Level	Competence
1	<p>Draw the projection of following points. Give 30mm space between each projectors with proper dimensions.</p> <p>A is 35 mm above H.P. and 45 mm in front of V.P. (5)</p> <p>B is 40 mm above H.P. and in V.P. (5)</p> <p>C is in H.P. and 45 mm in front of V.P. (5)</p> <p>D is in both H.P. and V.P. (5)</p>	(BT-6)	Create
2	A line AB 70 mm long is inclined at an angle of 45° to H.P. and 30° to V.P. The point A is 20 mm above H.P. and 15 mm in front of V.P. Draw the projections of the straight line.(20)	(BT-6)	Create
3	The end A of a line AB is 10mm in front of VP and 20mm above HP. The line is inclined at 30° to HP and front view is 45° with XY. Top view is 60 mm long. draw the projections. find the true length and inclination with VP.	(BT-6)	Create
4	A line measuring 75mm long has one of its ends 50 mm in front of VP and 15 mm above HP. The top view of the line measures 50mm. The other end is 15mm in front of VP and above HP. Draw and measure the front view. Determine the true inclinations and traces (20)	(BT-6)	Create
5	A line AB 65mm long has its end A, 10 mm above HP and 25mm in front of VP. It is inclined at 65° to HP and 25° to VP. Draw its projections. 20)	(BT-6)	Create
6	The mid-point of a straight line AB is 60 mm above H.P. and 50 mm in front of V.P. the line measures 80 mm long and inclined at 30° H.P. and 45° to V.P. Draw its projections.(20)	(BT-6)	Create
7	The front view of a line AB 90 mm long is inclined at 45° to XY line. The front view measures 65 mm long. Point A is located 15 mm above H.P. And is in V.P. Draw the projection and find its true inclinations.(20)	(BT-6)	Create
8	A room is 4.8 m x 4.2 m x 3.6 m high. Determine graphically, the distance between a top corner and the bottom corner diagonally opposite to it. (20)	(BT-6)	Create
9	Draw the projection of pentagonal plate whose side is 30 mm long, which is rest on HP by one of its edge and inclined at 45° to VP. The surface of the plate is inclined at 30° to HP.(20)	(BT-6)	Create
10	Draw the projection of hexagonal plate whose side is 30 mm long, which is rest on HP by one of its edge and inclined at 45° to VP. The surface of the plate is inclined at 30° to HP.(20)	(BT-6)	Create
11	A rectangular plate of side 50 x 25 mm is resting on its shorter side on H.P. and inclined at 30° to V.P. Its surface is inclined to H.P. such that top view looks like square. Draw its projections.(20)	(BT-6)	Create
12	A hexagonal lamina of side 30 mm rests on one of its corner on H.P. the diagonal containing the corner inclined 60° to V.P. The surface of the lamina is inclined 50° to H.P. Draw its projection. (20)	(BT-6)	Create
13	A square lamina of side 40 mm rests on one of its corner on H.P. the diagonal containing the corner inclined 55° to V.P. The surface of the lamina is inclined 35° to H.P. Draw its projection. (20)	(BT-6)	Create
14	A pentagonal lamina of side 30 mm rests on one of its corner on H.P. the edge opposite to resting corner is inclined at 45° to V.P. The surface of the lamina is inclined to H.P. such that the edge opposite to the resting corner is 35 mm above H.P. Draw its projection. (20)	(BT-6)	Create
15	A circular lamina of diameter 40 mm rests on one of its circumference point on H.P. the diameter containing the point inclined 45° to V.P. The surface of the lamina is inclined 40° to H.P. Draw its projection.(20)	(BT-6)	Create

UNIT III PROJECTION OF SOLIDS

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.

Q. No	Questions	BT Level	Competence
1	Draw the projections of a pentagonal pyramid of 30mm base edges and axis 70 mm long rest on one of its base corner in H.P with axis inclined at 40° to H.P. and parallel to V.P.(20)	(BT-6)	Create
2	A pentagonal prism of base side 30 mm and axis length 60 mm rests on the HP on one of its base edges with its axis inclined at 50° to HP and parallel to the VP. Draw its top and Front views.(20)	(BT-6)	Create
3	A right regular hexagonal pyramid, edge of base 30 mm and height 70 mm rests on one of its base edges on H.P. with its axis parallel to V.P. Draw the projections of the pyramid when its base makes an angle of 45° to the H.P. (20)	(BT-6)	Create
4	A hexagonal prism of base side 40 mm and axis length 60 mm rests on the HP on one of its base edges with its axis inclined at 50° to HP and parallel to the VP. Draw its top and Front views.(20)	(BT-6)	Create
5	A square pyramid of base side 40mm and axis length 70mm is resting on HP on one of its base edge with its axis parallel to VP and inclined 50° to HP. Draw its projections.(20)	(BT-6)	Create
6	A right pentagonal pyramid of side 30 mm and altitude 60 mm rests on one of its edges of the base in the HP. The base is being tilted up such that the apex is 50 mm above HP. Draw the projection of the pyramid when the edge on which it is resting is perpendicular to V.P.(20)	(BT-6)	Create
7	Draw the projection of a cone of diameter 40mm and height 70mm lying on the ground on one of its base point such that base makes an angle 40° to H.P. and perpendicular to V.P.(20)	(BT-6)	Create
8	A hexagonal prism of base side 30mm and axis length 60mm lies on the HP on one of its longer edges with its faces equally inclined to the HP. Draw its projections when its axis is inclined at 55° to the VP.(20)	(BT-6)	Create
9	A hexagonal pyramid of side 30mm, axis 70 mm long lies with one of its triangular faces on the HP and its axis parallel to VP. Draw its projections.(20)	(BT-6)	Create
10	A hexagonal pyramid of side 30mm, axis 70 mm long rest on one of its base edge in H.P. with triangular faces containing the resting edge is vertical to both the planes. Draw its projections.(20)	(BT-6)	Create
11	A pentagonal pyramid of side of base 30 mm and axis 70 mm long is freely suspended from a corner of the base. Draw the projections by the change of position method.(20)	(BT-6)	Create
12	A cylinder, diameter of base 40 mm diameter and height 80mm is having point of its periphery of base on H.P. with axis of the cylinder inclined to H.P. at 50° and parallel to V.P. draw the projections of the cylinder.(20)	(BT-6)	Create
13	Draw the projections of a pentagonal pyramid of 30 mm base edges and axis 70 mm long rest on one of its base corner in H.P with the slant edge having a resting corner is vertical to H.P. and parallel to V.P.(20)	(BT-6)	Create
14	Draw the projections of a pentagonal pyramid of 30 mm base edges and axis 70 mm long rest on one of its slant edge in H.P and parallel to V.P.(20)	(BT-6)	Create
15	Draw the projection of a cube of 40 mm edge resting on the HP on one of its corners with a solid diagonal vertical.(20)	(BT-6)	Create

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones.

Q. No	Questions	BT Level	Competence
1	A hexagonal prism of base side 30mm and axis 60mm rests on its base on HP with its axis perpendicular to HP and one of the base edge parallel to VP. The solid is cut by a plane which is perpendicular to VP, inclined at 40° to HP and bisecting the axis of the prism. Draw the front view, sectional top view and true shape of the section.(20)	(BT-6)	Create
2	A square pyramid has a base side of 40mm and altitude 80mm. It rests with its base on HP such that one side of the base is inclined at 30° to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 45° to HP. Draw the front view, sectional top view and true shape of the section.(20)	(BT-6)	Create
3	A cylinder of base diameter 50mm and height 65mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 30° to HP and meets the axis at a distance 30mm from the base. Draw the front view, sectional top view and true shape of the section.(20)	(BT-6)	Create
4	A cone of base diameter 50mm and altitude 60mm rests on its base on the HP. It is cut by a plane inclined at 45° to HP and passes through a point on axis which is 20mm above HP. Draw the front view, sectional top view and true shape of the section. (20)	(BT-6)	Create
5	A hexagonal pyramid of base 30mm and axis 60mm is resting on HP on its base with two sides of base perpendicular to VP. It is cut by a plane inclined at 45° to VP, perpendicular to HP and 10mm away from the axis. Draw its top view, sectional front view and true shape of the section.(20)	(BT-6)	Create
6	A hexagonal prism, side of base 30mm and axis 60mm long, rests with its base on HP such that one of its rectangular faces is parallel to VP. A sectional plane perpendicular to HP and inclined at 35° to VP cuts the prism at a distance of 10 mm from the axis. Draw its top view and sectional front view.(20)	(BT-6)	Create
7	A cube of 40 mm long edges have its vertical faces equally inclined to V.P. it is cut by an auxiliary inclined plane in such a way that the true shape of the cut part is regular hexagon. Determine the inclination of the cutting plane with H.P. Draw the top sectional view and true shape of the section and its lateral development.	(BT-6)	Create
8	A hexagonal pyramid of base side 30mm and axis height 60mm is resting on HP on its base with a base edge parallel to VP. It is cut by a plane perpendicular to VP, inclined 70° to HP and passing through a point in its axis at a distance of 20mm from the base. Draw the sectional top view and true shape of the section.(20)	(BT-6)	Create
9	A hexagonal prism of base 30mm side and axis 60mm long is resting on its base on HP with a base edge parallel to VP. It is cut by a plane perpendicular to VP, inclined 35° to HP. Draw the sectional top view and front view of the prism. Also draw the development of the complete surface.(20)	(BT-6)	Create
10	A hexagonal pyramid of base side 30mm and axis height 60mm is resting on its base on HP with two of the base edges parallel to VP. It is cut by a plane perpendicular to VP, inclined 30° to HP and bisects the axis of the pyramid. Draw the development of the lateral surfaces of the lower portion of the pyramid.(20)	(BT-6)	Create
11	A cylinder of base diameter 50mm and height 65mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 30° to HP and meets the axis at a distance 30mm from the base. Draw the development of the lateral	(BT-6)	Create

- surface of the cylinder.(20)
- | | | | |
|----|---|--------|--------|
| 12 | A cone of base diameter 50mm and height 70mm rests on its base on the ground. A string is wound round the curved surface of the cone starting from left extreme point and ending at the same point. Find the shortest length of the string required. Trace the path of string in front and top views.(20) | (BT-6) | Create |
| 13 | A cone of base diameter 50mm and height 70 mm rests on its base on the ground. A cutting plane inclined at 50° to H.P. and meeting the axis 25 mm from the base. Draw the development of the lateral surface of cut cone. | (BT-6) | Create |
| 14 | A pentagonal pyramid has a base side of 30mm and axis height of 70mm. It rests with its base on HP such that one of the base edges perpendicular to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 50° to HP. Draw the development of the remaining portion of the pyramid.(20) | (BT-6) | Create |
| 15 | Draw the development of the lateral surface of hexagonal prism of 30mm base edge and 60mm height. An insect moves on its surface from a corner on the base to the diametrically opposite corner of the top face by the shortest route Trace graphically the path of the insect in front view.(20) | (BT-6) | Create |



UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS

Principles of isometric projection – isometric scale – Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical position. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

Q. No	Questions	BT Level	Competence
1	A hexagonal prism of base side 30mm and height 60 mm rests on the H.P by base with one of the base edge is parallel to V.P. It is cut by a plane perpendicular to the V.P and inclined 45° to the H.P. The cutting plane bisect axis. Draw the front view, sectional top view and Isometric View.	(BT-6)	Create
2	A pentagonal pyramid of side of base 30 mm and length 60 mm rests on HP by its base with one of the base edge is parallel and nearer to VP. The solid is cut by a plane perpendicular to VP and inclined at 45° to HP and meet the axis of the pyramid at 20 mm above the base. Draw the Isometric projections of the Truncated pyramid.	(BT-6)	Create
3	A hexagonal prism of base side 30mm and axis 60mm is resting on HP on one of its bases with two of the vertical faces perpendicular to VP. It is cut by a plane inclined at 50° to HP and perpendicular to VP passing the axis at a distance of 12mm from the top surface. Draw the isometric projection of the truncated prism.(20)	(BT-6)	Create
4	A pentagonal pyramid of base 30mm and height 65mm stands with its base on HP. An edge of the base is parallel to VP and nearer to it. A horizontal section plane cuts the pyramid and passes through a point on the axis at a distance of 25mm from the apex. Draw the isometric view of the frustum of the pyramid.(20)	(BT-6)	Create
5	A cylinder of base diameter 40mm and height 60mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 45° to HP. The cutting plane meets the axis at a distance of 15mm from the top surface. Draw the isometric view of the truncated cylinder.(20)	(BT-6)	Create
6	A hexagonal pyramid of base side 30mm and height 60mm rests on its base on HP with two of its base edges perpendicular to VP. It is cut by a plane perpendicular to VP and inclined at 25° to HP, meeting the axis at a point 25mm above the base of the pyramid. Draw the isometric projection of the truncated pyramid.(20)	(BT-6)	Create
7	A pentagonal prism of base side 30mm, axis 60mm is resting on its base on HP with one of its base edges parallel to VP. It is cut by a plane perpendicular to VP, inclined 55° to HP and cut the axis at a distance of 35mm from the base. Draw the isometric projection of the truncated prism.(20)	(BT-1)	Create
8	A sphere of radius 18mm is placed centrally over a hexagonal slab of side 30 mm and thickness 25mm. Draw the isometric view of the combined solid.(20)	(BT-6)	Create
9	The frustum of a pentagonal pyramid with base side 30mm and top surface of 15mm side has a height of 40mm. draw its isometric view.(20)	(BT-6)	Create
10	A rectangular prism 30 x 50 x 70 is placed on the ground behind the picture plane with the longest edges vertical and longer base edge receding to the left at an angle of 40° to the picture plane. The nearest vertical edge is on the picture plane and 15 mm to the left of the observer who is at a distance of 60 mm in front of picture plane. The height of the observer above the ground is 90 mm. draw the perspective view of the prism.(20)	(BT-6)	Create
11	A square pyramid of base side 30mm and height 75mm rests with its base on ground such that the nearest edge of the base is parallel to picture plane and 40mm behind it. The station point is 70mm in front of the picture plane, 60mm to the right of the axis of the pyramid and 50mm above the ground. Draw the	(BT-6)	Create

- perspective view of the pyramid. (20)
- 12 A cube of 35mm edge lies with a face on the ground and an edge on the picture plane. All the vertical faces are equally inclined to picture plane. The station point is 80mm in front of the PP and 60mm above the ground. The edge of the cube in contact with the picture plane is situated 10mm to the right of the station point. Draw the perspective projection of the cube.(20) (BT-6) Create
- 13 A square prism of base 25 x 25 and height 50 mm is resting on the GP on its square base with a right side rectangular face making 60° with Picture Plane. The corner nearest to the PP is 40 mm to the left of the station point and 20 mm behind the PP. The station point is 60 mm above the GP and 50 mm in front of the PP. Draw the perspective view of the prism by using Visual Ray method.(20) (BT-6) Create
- 14 A square prism, side of base 40 mm and height 60 mm rests with its base on the ground such that one of its rectangular faces is parallel to and 10 mm behind the picture plane. The station point is 30 mm in front of PP, 80 mm above the ground plane and lies in a central plane 45 mm to the right of the center of the prism. Draw the perspective projection of the square prism.(20) (BT-6) Create
- 15 A square pyramid of base 30mm, axis height 45mm rests with its base on GP. One of the base edges is parallel to PP and 20mm behind it. The station point S is 60mm above ground plane, 70mm in front of picture plane and lies in the central plane which is 40mm to the right of the axis of the pyramid. Draw the perspective projection of the square pyramid.(20) (BT-6) Create

