Engineering Graphics – I (MME 1161)

Question Bank

(Applicable to 2020 – 21 Batch of Students)

Engineering Graphics – I Question Bank

ENGINEERING GRAPHICS – I

Engineering Graphics – I
[COMMON To All Sections]

MME 1161 Engineering Graghics – I [1 0 2 2]

Introduction – Geometrical constructions, Dimensioning and conventions of lines.

Projection of points – Theory of Orthographic projections, Reference planes, Quadrants, Types of quadrants, Conventional representation of first angle projection system, Projection of points in first Quadrant only. (03 hours)

Projection of straight lines – Line parallel to both reference planes, Line perpendicular to either horizontal or vertical or profile plane, Line inclined to horizontal plane, Line inclined to vertical plane, Line inclined to both horizontal and vertical planes, Finding true length and true inclinations, Locating the horizontal and vertical traces of lines, Application problems on lines (Rotating line method only). (12 hours)

Projection of plane surfaces – Projections of regular planes (Triangle, Square, Rhombus, Rectangle, Pentagon, Hexagon and Circle), Plane resting on edge and corner conditions, Surface inclined to HP and perpendicular to VP, Surface inclined to VP and perpendicular to HP, Plane surface inclined to both HP and VP (Change of position method only). (12 hours)

Projection of solids – Projection regular solids like prisms & pyramids (Triangle, Square, Rectangle, Pentagon and Hexagon), Cone and cylinder, Solids resting on edge and corner conditions, Axis inclined to HP and parallel to VP, Axis inclined to VP and parallel to HP. Axis inclined to both HP and VP (Change of position method only). (12 hours)

Engineering Graphics – I Question Bank

COURSE OUTCOMES (COs)

At the end of the course the student will be able to:

CO 1: Solve the engineering graphics exercises as per the given instruction in the class.

CO 2: Create orthographic engineering drawings as per given dimensions.

CO 3: Create the orthographic engineering drawings using appropriate Computer Aided Engineering (CAE) tools.

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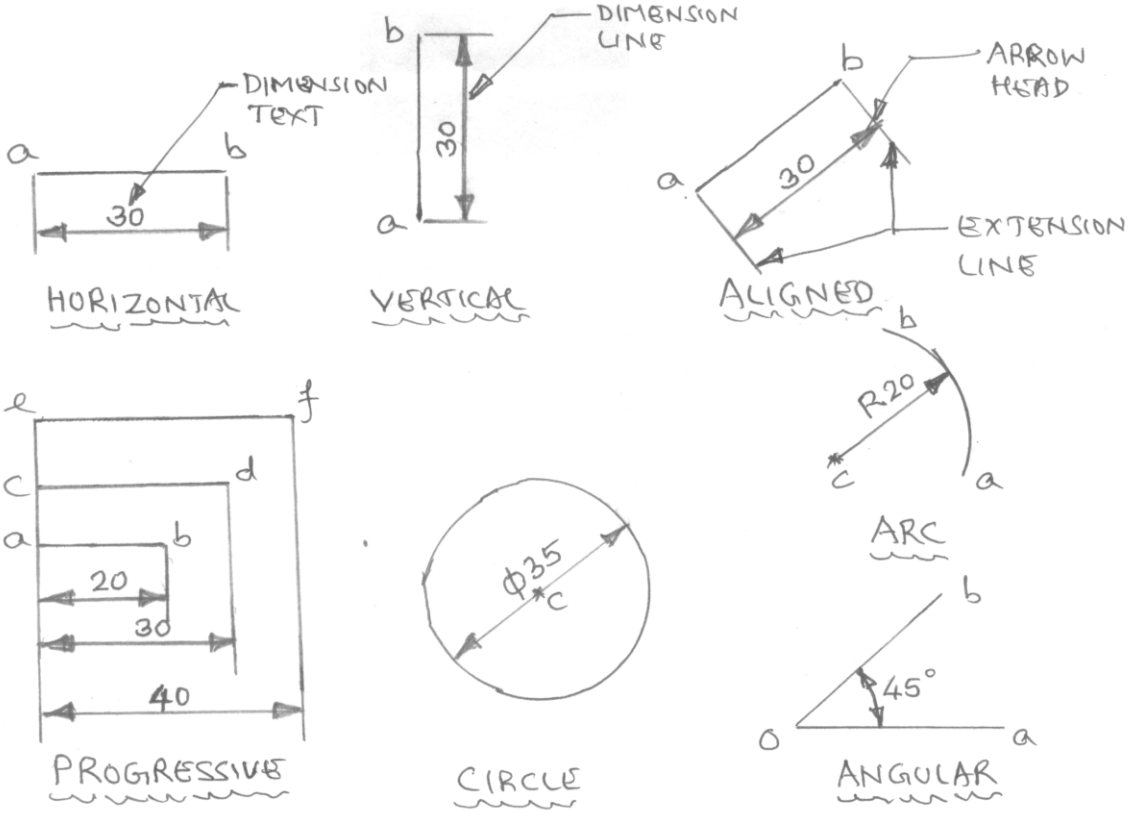
DIMENSIONING

LINEAR (ALIGNED SYSTEM):



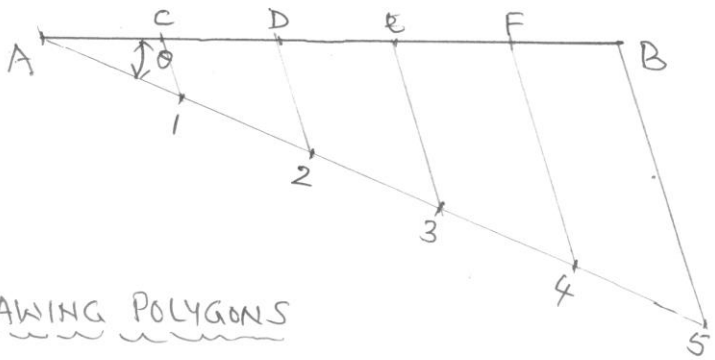
LINETYPES

1. CONTINUOUS (THIN) ———————
   – USED FOR CONSTRUCTION LINES, PROJECTORS ETC. (2H PENCIL).
2. CONTINUOUS (THICK/DARK) ———————
   – USED TO REPRESENT VISIBLE EDGES. (HB PENCIL).
3. DASHED LINES - - - - - - - - - - - -
   – USED TO REPRESENT INVISIBLE EDGES (HB PENCIL).
4. AXIS LINE — — — — — — — —
   – USED TO REPRESENT AXIS OF SOLID, SECTION PLANE. (H PENCIL).

Engineering Graphics – I Question Bank

GEOMETRIC CONSTRUCTIONS

I DIVIDING A LINE OF UNKNOWN LENGTH INTO "N" NUMBER OF EQUAL DIVISIONS.



AB – GIVEN LINE

θ – ANY ACUTE ANGLE (30-60°)

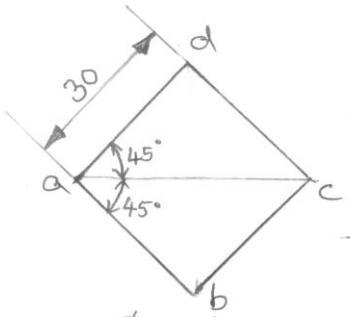
A1 = 12 = 23 = 34 = 45

JOIN B TO 5.

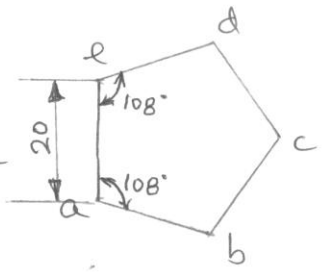
DRAW LINES PARALLEL TO B5 AT 1, 2, 3 & 4 TO GET C, D, E & F ON AB.

NOW AC = CD = DE = EF = FB.

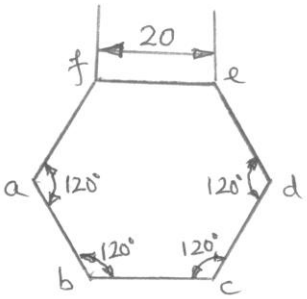
II DRAWING POLYGONS



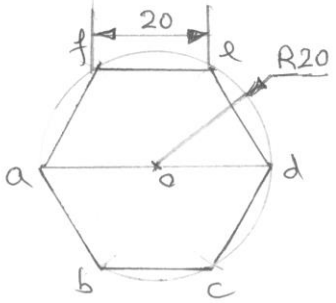
SQUARE

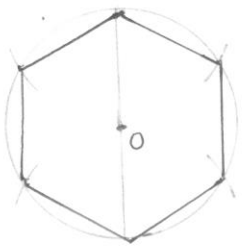


PENTAGON



HEXAGON





HEXAGON (BY CIRCLE METHOD)

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PROJECTION OF POINTS

1. A point P is 30 mm above HP, 20 mm in front of VP and 10 mm from the RPP. Draw the three principal orthographic views of the point.
2. A point is 30 mm in front of VP, 20 mm above HP and 25 mm from LPP. Draw its projections and name the side view.
3. A point R is on HP, 40 mm in front of VP and 20 mm from LPP. Draw the front, top and right side views.

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Engineering Graphics – I Question Bank

PROJECTION OF LINES

1. A line 80 mm long is parallel to & 25 mm in front of VP. One of its ends is 10 mm above HP while the other end is 50 mm above HP. Draw its projections and find its inclination with HP.
2. A line 80 mm long is parallel to HP and 20 mm above it and inclined at 40 ° to VP. The midpoint of the line is 50 mm in front of VP. Draw its projections.
3. A line MN of length 70 mm is parallel to both VP & RPP. The end M is 10 mm above HP and 30 mm from RPP. The line is 20 mm in front of VP. Draw the three principal views of projections.
4. A line AB 80 mm long, has its end A 20 mm above HP and 30 mm in front of VP. It is inclined at 30 ° to HP and 45 ° to VP. Draw the projections of the line.
5. A line MN of length 70 mm has its end M at the intersection of both the reference planes. The line is inclined at 45 ° to HP and 30 ° to VP. Draw the top and front views of the line.
6. The front view of a line AB of length 70 mm is inclined at 30 ° to XY line and measures 45 mm. The end A is 20 mm above HP and 25 mm in front of VP. Draw the projections of the line and determine its inclination with HP and VP.
7. A line PQ 85 mm long has its end P 10 mm above HP and 15 mm in front of VP. The top and front views of the line PQ are 50 and 75 mm respectively. Draw the projections of the line and find its inclination with HP and VP.
8. A line AB 60 mm long, has one of its extremities 20 mm in front of VP and 15 mm above HP. The line is inclined at 25 ° to HP and 40 ° to VP. Draw the top and front views of the line.
9. A line CD measuring 70 mm has its end C 15 mm in front of VP and 20 mm above HP and the other end D is 60 mm in front of VP and 50 mm above HP. Draw the projections of the line and determine its inclination with both the reference planes of projection.

10. The distance between the end projectors through the end points of a line AB is 60 mm. The end A is 10 mm above HP and 15 mm in front of VP. The end B is 35 mm in front of VP. The line AB appears as 70 mm long in the front view. Draw the projections and determine its true length and the inclinations.
11. A line AB of length 80 mm is inclined at 30 ° to HP and 60 ° to VP. The end A is 20 mm in front of VP and 30 mm above HP. Draw the projections of the line.
12. A line CD of length 80 mm is inclined at 30 ° to HP and 45 ° to VP. The midpoint M of the line is 50 mm above HP and 70 mm in front of VP. Draw the projections of the line.
13. The top view of a 75 mm long line AB measures 65 mm, while the front view is 50 mm. End A is in HP and 12 mm in front of VP. Draw the projections of line AB and determine its inclination with HP & VP.
14. A straight line PQ, 65 mm long, is inclined at 45 ° to HP and 30 ° to VP. The point P is 70 mm from both the reference planes of projection and the end Q is nearer to both HP and VP. Draw its projections.
15. The end P of a line PQ is 40 mm above HP and 20 mm in front of VP. Other end Q is 20 mm above HP and 50 mm in front of VP. The top view of the line is inclined at 30 ° to XY line. Draw the projections.
16. A line 80 mm long rests with one end on HP, while the other end on VP. Line is inclined at 30 ° to HP and 45 ° to VP. Draw its projections.

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Engineering Graphics – I Question Bank

PROJECTION OF PLANES

1. A regular pentagonal lamina of sides 30 mm is resting with one of its corners such that the two sides passing through that corner make equal inclinations with HP while the surface is perpendicular to VP. The lamina is inclined at 45 ° to HP. Draw its projections.
2. A hexagonal lamina of sides 30 mm has one of its sides on VP. The plane is vertical and inclined to VP at 30 °. The nearest corner to HP is 30 mm above it. Draw its projections.
3. The surface of a mirror of 60 mm × 80 mm is inclined to the wall and perpendicular to floor such that its front view is a square of 60 mm side. Draw the projections and find the inclination of the mirror to the wall.
4. An equilateral triangular lamina of 50 mm sides lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60 °. The edge on which it rests is inclined to VP at 60 °. Draw the projections.
5. A square lamina of 50 mm edge rests on one of its sides on HP. The lamina makes 30 ° with HP and the side on which it rests makes 45 ° to VP. Draw its projections.
6. A square lamina of 60 mm side rests on one of its corners on HP. The lamina makes an inclination of 45 ° with HP and the diagonal parallel to HP makes an angle of 30 ° to VP. Draw its projections.
7. A rectangular plate of 35 mm × 25 mm and negligible thickness has one of its shorter edges on HP with that edge inclined at 40 ° to VP. Draw the top and front views if it appears as a square in the top view.
8. A pentagonal lamina of sides 30 mm is resting on HP with one of its sides, such that the surface makes an angle of 60 ° with HP. The edge on which it rests is inclined at 45 ° to VP. Draw its projections.
9. A pentagonal lamina of sides 30 mm is having a side both on HP & VP. The corner opposite to the side on which it rests is 15 mm above HP. Draw the top & front views of the lamina.

10. A hexagonal lamina of sides 25 mm is resting with one of its sides on HP. The lamina makes 45 ° to HP and the side on which it rests makes 30 ° to VP. Draw its projections.
11. A hexagonal lamina of sides 30 mm rests on one of its corners on HP. The lamina makes 45 ° to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30 ° to VP. Draw its projections.
12. A hexagonal lamina of sides 25 mm rests on one of its sides on HP. The lamina makes an angle of 45 ° to HP and the side on which it rests makes an angle of 45 ° to VP. Draw its projections.
13. Draw the projections of a circular plate of 50 mm diameter and negligible thickness resting on HP on a point A of the circumference, with its plane inclined at 45 °to HP. Draw its projections.
14. A circular lamina of 50 mm diameter is standing with one of it points of the rim on HP and the surface is inclined at 45 ° to HP. The diameter at right angle to the diameter that is passing through the point on which the lamina rests is parallel to VP. Draw its projections.
15. A circular lamina of 50 mm diameter rests on VP such that the diameter passing through the point on which the lamina rests is inclined at 30 ° to VP while the diameter perpendicular to the diameter passing through the point on which the lamina rests is parallel to HP. Draw the top & front views in this position.

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Engineering Graphics – I Question Bank

PROJECTION OF SOLIDS

1. A triangular prism of sides 30mm and axis 60 mm resting on HP with one of its sides such that the base is perpendicular to VP and inclined at 30 ° to HP. Draw the front, top and left side views.
2. A cube of 30 mm sides is resting on HP on one of its sides. One of the square faces containing that side is inclined at 30 ° to HP. Draw the projections.
3. A cube of sides 30 mm is resting on VP with one of its corners such that the axis makes an angle of 30 ° to VP. Draw its projections.
4. A triangular pyramid of slant height 65 mm and base edge 30 mm long is resting with its apex on HP such that one of its inclined triangular faces makes an angle of 30 ° with HP. Draw the top & front views of the solid.
5. A square pyramid of sides 30 mm and height 60 mm is resting on one of its triangular faces on HP such that the axis is parallel to VP. Draw its projections when the apex of the pyramid is on the right side of the base.
6. A pentagonal pyramid of 30 mm base edges and axis 70 mm long is lying on one of its triangular faces on HP. Draw its projections when the base edge of this face is perpendicular to VP and the vertical plane containing the axis is parallel to VP.
7. A pentagonal pyramid 30 mm sides of base and 65 mm slant height rests on HP on one of its base edges. Draw the projections of the pyramid when the axis is inclined at 40 ° to HP.
8. A hexagonal pyramid 25 mm sides of base and 60 mm axis length rests on VP on one of its corners of the base. Draw its projections of the pyramid when the axis is inclined at 45 ° to VP.
9. A square prism of sides 30mm and height 65 mm is resting on HP on one of its base corners such that the longer edge passing through that base corner is inclined at 60 ° to HP. Draw its projections.
10. A square prism of 30 mm side of base & 60 mm height rests on HP on one of its longer edges such that one of the rectangular surfaces containing that

longer edge on which it rests is inclined at 30 ° to HP, while the axis of the solid is inclined at 60 ° to VP. Draw its projections.

11. A pentagonal prism of 30 mm sides of base and 60 mm long axis rests on HP on one of its edges of the base. Draw its projections of the prism when the base is inclined at 40 ° to HP.
12. A hexagonal prism of 30 mm base edges and 70 mm long axis is resting on one of its base corners on VP such that the axis is inclined at 60 ° to VP. Draw the projections.
13. A cone of base diameter 50 mm and 70 mm long axis has one of its generators on VP. Draw its projections when the axis is parallel to HP.
14. A cone of 50 mm base diameter and 60 mm long axis rests on HP on one of its generators, with the vertical plane passing through this generator and the axis is parallel to VP. Draw the projections.
15. A cone of diameter of base 50 mm and generator length of 70 mm rests on a point of its rim on HP such that the axis is inclined at 30 ° HP. Draw its projections.
16. Draw the top and front views of a right circular cylinder of base 60 mm diameter and axis 75 mm long resting on a point of its rim on HP. The axis of the cylinder is parallel to VP and inclined at 30 ° to HP.
17. Draw the projections of a cylinder of base diameter 50 mm and axis length 70 mm is resting on VP on a point of its rim with the axis inclined at 30 ° to VP and the plane containing the point on which the solid rests and the axis is horizontal and is parallel to HP.
18. A tetrahedron of 40 mm sides rests with one of its edges on HP such that one of its triangular faces is parallel to VP and 10 mm in front of it. Draw its projections.
19. A rectangular based prism of sides 30mm × 40 mm and height 70 mm resting on HP with its longer base edge such that the base is inclined at 30 ° to HP and the axis appears to be inclined at 30 ° to VP. Draw its projections.

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