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CIRCULAR

Subject   Question Bank for course 21EVN15/25 Engineering Visualization regarding...

Reference   Approval of Hon'ble Vice-Chancellor dated: 13.04.2022

The "**21EVN15/25-Engineering Visualization**" is a mandatory Engineering Science Course in scheme 2021 for 1st /2nd-semester students of University admitted in the academic year 2021-22 and onward. The question bank module wise for the above said course has been prepared by the Board of Studies in Mechanical Engineering of VTU Belagavi. The same has been attached with this circular for stakeholders' information and reference.

The Principals of all the Engineering Colleges coming under the ambit of the University are hereby informed to bring this information to the notice of the students and faculty concerned.

Sd/-
REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The In-charge Director, SMUITI, VTU Belagavi for information and to make arrangements to upload on the VTU web portal.

REGISTRAR

Visvesvaraya Technological University, Belagavi

Question Bank

Engineering Visualization EV15/25

It is not mandatory to pick the questions from this QB. Similar questions can be framed for evaluation of students learning in CIE / SEE. Based on the questions & time requirements marks can be allocated by the examiners suitably. Further, it is recommended to all the course coordinators to refer the *Text Books* and *Reference Books.*

MODULE 01

i) Projections of Points

1. A point 20 mm below the reference XY line is the top view of three P, Q & R points. P is 20 mm below HP, Q is 35 mm above HP and R is on HP. Draw the projections of the three points and state their positions and quadrants in which they are situated.

2. Two points, P and Q, are on HP. The point P is 30 mm behind VP, while Q is 50 mm in front of VP. Find the horizontal distance between their projectors parallel to the XY line. The line joining their top views makes an angle of 40° with XY.

3. A point M is 30 mm in front of VP and 20 mm above HP. Another point N is 15 mm behind VP & 25 mm below HP. The horizontal distance between the points parallel to XY line is 50 mm. Draw the projections of the points M & N and join their front and top views. Draw the right-side view for point N only.

4. A point A is on HP and 35mm in front of VP. Another point B is on VP and below HP. The line joining their front views makes an angle of 30° to XY line while the line joining their top views makes an angle 45°with XY line. Find the distance of the point B from HP.

5. Draw the projections of a point A lying 30mm above HP and in first quadrant, if its shortest distance from the line of intersection of HP and VP is 50mm. Also find the distance of the point from VP

ii) Projections of lines

1. A line PQ has its end A xxxx mm above HP and xxxx mm in front of VP; end B is xxxx mm below HP and xxxx mm behind VP. The distance between the end projectors is xxxx mm. Draw the projections of xxxx mm. Draw the projections of line, true length, and true inclination by both the methods.

2. A line PQ xxxx mm long makes an angle of xxxx° to HP and xxxx ° to VP. The end P is xxxx mm in front of VP and xxxx mm above HP. Draw the projection.

3. Plane and elevation of a line PQ, xxxx mm long, measures xxxx mm and xxxx mm, respectively. End P is xxxx mm above HP and xxxx mm in front of VP. Draw its projections. Determine the true inclination with HP and VP.

4. A line AB, xxxx mm long, is inclined at xxxx ° to HP and xxxx ° to VP. Its middle point C is xxxx mm above HP and xxxx mm in front of VP. Draw its projection.

5. A line PQ has its end P in HP and xxxx mm in front of VP. Its front view is inclined at xxxx ° to *xy* and has a length of xxxx mm. The other end Q is in VP. Draw the projection and find out its true inclination with HP and VP.

6. *A wireless tower xxxx m high is tied at the top by two guide ropes having an angle of depression of xxxx° and xxxx°. The other end of the ropes is connected to two poles at a height of xxxx m and xxxx m, respectively. The two poles are xxxx m apart. Draw projection of the whole arrangement and find out the length of the ropes.*

7. *An electric lamp hung by an electric wire in the centre of a hall xxxx m × xxxx m × xxxx m at a distance of xxxx m from the ceiling. Determine graphically its distance from one of the corners of the floor.*

iii) Projections of Planes

1. *ABC* is an equilateral triangle of xxxx mm side. The end *A* is in HP and *B* is in V.P. Side *AB* is inclined at xxxx° to HP and xxxx° to VP. Side *BC* is inclined at xxxx° to HP. Draw the top view and front view of the triangle and find the inclination of side *AC* with HP.

2. A square lamina ABCD of xxxx mm side rests on one of its corners on the ground. Its plane is inclined at an angle of xxxx° to the HP and diagonal BD inclined at xxxx° to VP and parallel to HP. Draw its projections.

3. A regular pentagonal lamina ABCDE of xxxx mm side rests on HP on one of its sides such that it is inclined to HP at xxxx° and the side on which it rests is inclined at xxxx° to VP. Draw its projections.

4. A regular pentagonal lamina of side xxxx mm has one of its corners in VP and the plane of lamina is inclined at xxxx° to VP. The side of the lamina opposite to that corner is parallel to VP and inclined at xxxx° to HP. Draw the projections.

5. A pentagonal lamina of side xxxx mm has one of its corner in VP and the plane of lamina is inclined at xxxx° to VP. The side of the lamina opposite to that corner is parallel to VP and inclined at xxxx° to HP. Draw its projection.

6. A rectangular thin plane *ABCD* of xxxx × xxxx mm rests on its shorter side in the VP and the surface makes xxxx° angle with VP. The longer side of the plane is inclined at xxxx° to the HP. Draw its projection.

7. An equilateral triangular thin plate *PQR* of xxxx mm side lies on one of its side in VP. Draw the projections of the plate when the plate surface is vertical and inclined at xxxx° to VP. One of the sides of the triangular plate is inclined at xxxx° to the HP.

8. A circular lamina of xxxx mm radius appears as an ellipse of xxxx mm major axis and xxxx mm minor axis in the view from above. Draw the projections.

9. Draw the projection of an A4 size paper resting on the table at xxxx degrees on one of its shorter edge assuming thickness as zero

MODULE 02

1. A square pyramid, edge of the base xxxx mm and height xxxx mm, rests on its base on HP, with its base edge equally inclined to VP. Draw the three views of the square pyramid.

2. A right regular hexagonal pyramid, edge of the base xxxx mm and axis xxxx mm long, has an edge of the base in HP, such that its axis is inclined at xxxx° to HP and parallel to VP. Draw the projections by the two methods.

3. A hexagonal prism, edge of the base xxxx mm and height xxxx mm, rests on one of its base edges in HP such that its axis is inclined to HP at xxxx° and parallel to VP. Draw its projections by using both the methods.

4. A right circular cone, diameter of the base xxxx mm and height xxxx mm, lies on HP on one of its edges such that its axis is parallel to VP. Draw its projections.

5. A pentagonal pyramid, edge of base xxxx mm and height xxxx mm, lies on HP on one of its slant edge and has its axis parallel to VP. Draw its projections by using both the methods.

6. A pentagonal prism, side of base xxxx mm and height xxxx mm, rests on one of its base corners on HP such that its long edge containing the corner is inclined to the HP at xxxx° and the side of base opposite to the corner is inclined at xxxx° to VP. Draw the projections.

7. A right circular cone, diameter of base xxxx mm and height xxxx mm, lies on one of its generator in HP such that the generator is inclined to VP at xxxx°. Draw the projection.

8. A pentagonal pyramid, edge of the base xxxx mm and height xxxx mm, is held on ground plane on one of its base corner such that its axis is inclined at xxxx° to ground plane and xxxx° to VP. Draw the projections.

9. A right circular cylinder, diameter of base xxxx mm and height xxxx mm, rests on HP on its base rim such that its axis is inclined at xxxx° to HP and the top view of the axis is inclined at xxxx° to VP. Draw the projection.

10. A hexagonal pyramid, side of base xxxx mm and xxxx mm long, is resting on an edge of its base on the horizontal plane in such a way that it makes an angle of xxxx° to VP. The slant face containing the same edge makes an angle of xxxx° to HP.

11. A right hexagonal pyramid, side of base xxxx mm and height of axis xxxx mm, is resting on one of its triangular faces on the horizontal plane and the edge of the base contained by that triangular face make an angle of xxxx° to VP. Draw the projections taking apex nearest to VP.

12. A right pentagonal prism, xxxx mm high with each side of the base xxxx mm, is resting on one of the base edges on the horizontal plane and inclined at xxxx° to VP, and the face containing that edge is inclined at xxxx° to HP. Draw the projections of the pentagonal prism.

13. A circular cone of xxxx mm base diameter and axis xxxx mm long is resting on one of its generator on horizontal plane is such a way that its axis makes an angle of xxxx° with VP and apex towards VP. Draw its projection.

14. A right circular cone base diameter xxxx mm and axis xxxx mm ling is resting on the HP on a point of base circle with its axis making an angle of xxxx° with HP and its top view axis makes xxxx° angle with VP. Draw its projection.

15. Draw the front view and top view of right circular cylinder, base diameter xxxx mm and axis xxxx mm long, when it is resting on its circular rim in such a way that its axis makes an angles of xxxx° with HP and the top view of its axis is inclined at an angle of xxxx° to VP.

16. Draw the Front, Top & side view of a Motor vehicle of your choice or as per imagination by clearly depicting each features with drawing conventions

17. Draw the Front, Top & side view of a Refrigerator of your choice or as per imagination by clearly depicting each features with drawing conventions

18. Draw the Front, Top & side view of a student desk of your choice or as per imagination by clearly depicting each features with drawing conventions

19. Draw the Front, Top & side view of a student desk of your choice or as per imagination by clearly depicting each features with drawing conventions

20. Draw the three views of a given water bottle by clearly depicting each features with appropriate drawing conventions
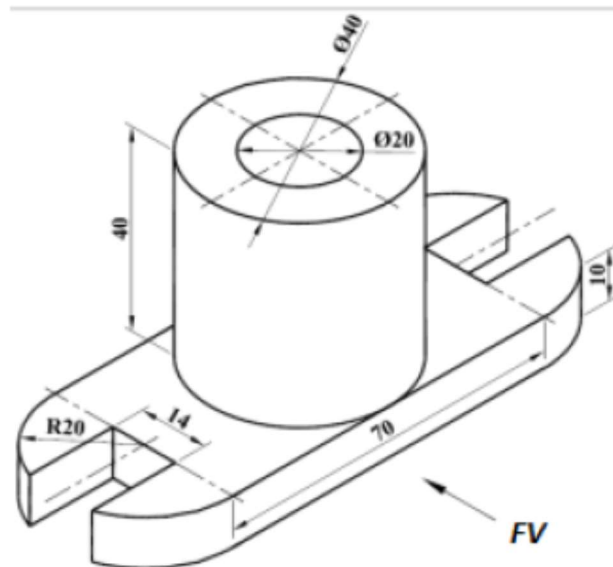
MODULE 03

1. A right circular cone of base diameter xxxx mm and height xxxx mm rests centrally on the top of a cube xxxx mm. Draw the isometric view of the combined solids.

2. Draw isometric view of a hexagonal prism with side of base xxxx mm and height xxxx mm surmounting a square pyramid of side xxxx mm and height xxxx mm, such that the axes of the two sides are collinear and at least one of the edges of the two solids is parallel.

3. A right regular pentagonal prism with edge of base xxxx mm and height xxxx mm has a circular hole of diameter xxxx mm drilled centrally through it along its axis. Draw its isometric view.

4. Draw the isometric view of a sphere of radius xxxx mm resting centrally on the top of the square prism of side xxxx mm and height xxxx mm. .

5. A rectangular pyramid of base 40mmx25mm and height 50mm is placed centrally on rectangular slab sides 100mmx60mm and thickness-20mm. Draw the isometric projection of the combination

6. The frustum of a square pyramid of base sides 40mm top face side 20mm and height 60mm rest on the center of the top of a square block of side 60mm and height 20mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of the combination of the solids.

7. A regular pentagonal prism of base edge 30mm and axis 60mm is mounted centrally over a cylindrical block of 80mm diameter and 25mm thick. Draw the isometric projection of the combined solids.

8. A cone of base diameter 50mm and height 40mm is placed centrally on the top face of a square slab side-80mm and height 20mm. Draw the isometric projection of the combination

9. A hemisphere of diameter 50mm is centrally resting on top of a square prism of base side 60mm and height 30mm such that the curved surface of the hemisphere is touching the top face of the prism. Draw its isometric projections

10. A sphere of diameter 30mm rests on the frustum of a hexagonal pyramid base 30mm, top face 18mm side and height 50mm, such that their axes coincide. Draw the isometric projection of the combined solids.

11. A hemisphere diameter 70mm is placed on the ground on its curved surface. A cone base diameter 70mm and height 70mm is placed centrally on it. Draw the isometric projection of the combination

12. Three cubes of sides 60mm, 40mm, and 20mm are placed centrally, one above the other in the descending order of their side. Draw the isometric projection of the combination of solids.

13.

Draw the complete orthographic views of the objects shown in Figure
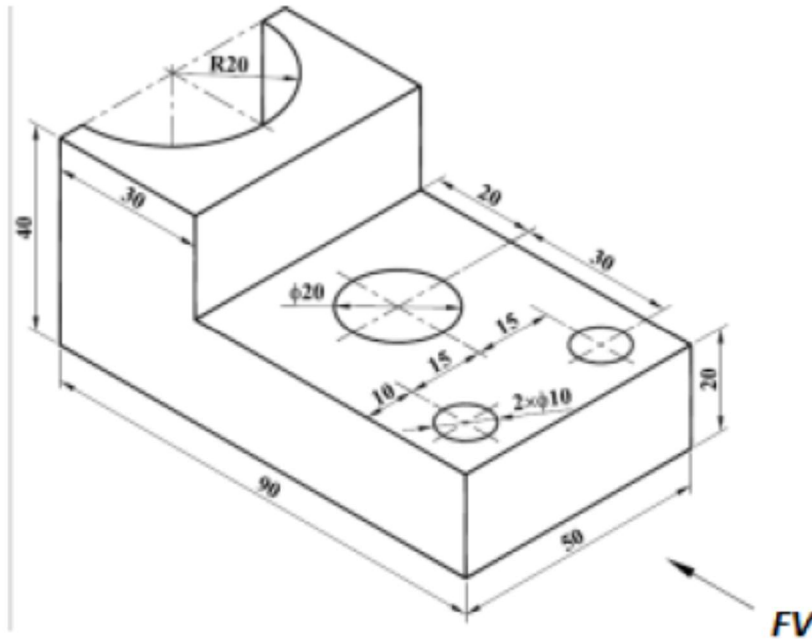
MODULE 04

1. A pentagonal prism of base side xxxx mm and height xxxx mm has one of its faces parallel to the VP. It is cut by a plane perpendicular to VP and inclined at xxxx degree to the HP and passing through the axis at a point xxxx mm above the base. Draw the development of the lower portion of the solid.

2. 5. A vertical chimney of circular section of xxxx mm diameter is located on the rooftop sloping at xxxx degree to the horizontal. If the shortest portion of the chimney is xxxx mm high, then determine the shape of the sheet metal area from which the chimney can be made. Use 1:10 scale.

3. 6. A cone of base xxxx mm diameter and height xxxx mm rests with its base on the HP. a section plane perpendicular to VP and inclined at xxxx degrees to the HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone.

4. A square prism of base side 40mm and axis length 65mm is resting on HP on its base with all the vertical faces equally inclined to VP. It is cut by an inclined plane 60° to HP and perpendicular to VP and passes through a

point on the axis at a distance of 15mm from the top face. Draw the development of the lower portion of the prism.

5. A square prism of base side 30mm and axis length 60mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60˚ to HP and perpendicular to VP and passes through a point on the axis at a distance 50mm from the base. Draw the development of the lower portion of the prism.

6. A square prism of 30mm side of base and height 50mm is resting with its base on HP such that one of its vertical faces is inclined at 40˚ to VP. It is cut as shown in the following front view figure. Draw the development of the lateral surface of the prism.

7. A regular pentagonal prism of height 60mm and base edge 30mm rests with its base on HP. The vertical face closest to VP is 30˚ to it. Draw the development of the truncated prism with its truncated surface inclined at 60˚ to its axis and bisecting it.

8. A hexagonal prism of base side 20mm and height 50mm is resting on HP on its base, such that one of its edges is parallel to VP. The prism is cut in this position, as shown in the following front view. Draw the development of the lateral surface of the prism.

9. A square pyramid of the side of base 45mm, altitude 70mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by a section plane perpendicular to the VP and inclined to VP at 40˚ to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces of the truncated pyramid.

10. A rectangular pyramid, side of base 25mm x 40mm and height 50mm has one of the sides of the base is inclined at 30˚ to the VP. Draw the development of the lateral surface of the cut pyramid, whose front view is shown below.

11. A pentagonal pyramid of 30mm edges of the base and 50mm height rests vertically with one of its bases edges parallel to VP and nearer to it. It is cut as shown in the following figure; draw the development of the lateral surfaces of the upper portion of the pyramid.

12. A hexagonal pyramid of 30mm base sides with a side parallel to VP. Draw the development of the lateral surfaces of the retained portions of the pyramid are cut by two perpendicular planes.

13. A funnel is made of sheet metal. The funnel tapers from 60mm to 30mm diameter to a height of 25mm and then forms to a cylinder with a height of 50mm. The bottom of the funnel is beveled off completely at an angle of 45˚ to the axis. Draw the development of the funnel.

14.

Development of the lateral surface of the funnel as shown below.
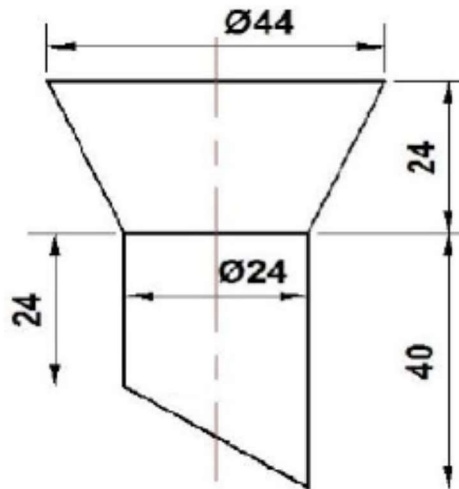
15.

Development of the lateral surface of the tray as shown below.