Engineering Graphics Important Questions PDF

Engineering Graphics usually covers scales and engineering curves, projections of points and lines, projections of planes and solids, sections and development of surfaces, and isometric projection with an introduction to CAD. Almost every question is a drawing, so marks come from correct construction, neat lines, proper dimensioning and labelling.

Key takeaways

- Scales and curves: representative fraction, plain and diagonal scales, ellipse, parabola, hyperbola, cycloid and involute.
- Projections: first-angle method, points, lines inclined to both planes, true length and traces.
- Planes and solids: prisms, pyramids, cylinders and cones resting in different positions.
- Sections, development and isometric views, plus basic CAD commands.
- These are practice questions based on common syllabus topics, not verified past papers.

About these important questions

These are **practice questions** built from topics that appear in most Indian B.Tech syllabi for Engineering Graphics, including AKTU and universities that follow the AICTE model curriculum. They are **not verified past papers**, and we do not claim that any question will appear in your exam. Unit numbers and topic order differ between universities, so first match each unit below with your own university syllabus. For real previous papers, use your university's official archive. AKTU students can download them from the AKTU old question paper page.

Each unit lists key definitions, derivations or theory questions, numericals with short answer outlines, and long-answer questions. Use the outlines to check your method, then write full solutions yourself.

Unit 1: Scales and Engineering Curves

Key definitions: representative fraction (RF = drawing size / actual size), full, reducing and enlarging scales, plain scale, diagonal scale, vernier scale, conic sections, eccentricity, cycloid, epicycloid, hypocycloid, involute.

Important questions (construction outline):

- Construct a diagonal scale of RF 1:2500 to read metres, long enough to measure 400 m, and mark a given distance. Outline: length of scale = RF x maximum length = 400 m / 2500 = 16 cm. Divide into main units, then use the diagonal to read the smallest unit.

- Construct a plain scale for a given RF and show a given length on it.
- Draw an ellipse by the concentric circle method and by the oblong method, given major and minor axes.
- Draw a parabola and a hyperbola by the eccentricity method. Remember: e < 1 for an ellipse, e = 1 for a parabola and e > 1 for a hyperbola.
- Draw a cycloid for a rolling circle of given diameter for one full revolution, and draw a tangent and normal at a point on it.
- Draw the involute of a circle or a square.

Unit 2: Projections of Points and Lines

Key definitions: principal planes (HP and VP), profile plane, quadrants, first-angle and third-angle projection, reference line (XY), true length, apparent length, true inclinations (θ with HP, φ with VP), traces.

Important questions:

- Draw the projections of points placed in different quadrants and state their positions.
- Explain the difference between first-angle and third-angle projection, with the standard symbols. India uses the first-angle method in BIS drawing practice.
- A line AB, 80 mm long, is inclined at 30° to HP and 45° to VP, with end A 15 mm above HP and 20 mm in front of VP. Draw its projections. Outline: draw the true length at θ and φ, locate the locus lines, rotate to find the apparent lengths, then join the end projections.
- Given the front view and top view lengths of a line, find its true length and true inclinations by the rotating line method or the auxiliary plane method.
- Find the horizontal and vertical traces of a line.

Unit 3: Projections of Planes and Solids

Key definitions: perpendicular and oblique planes, regular polygons, prisms, pyramids, cylinders, cones, axis, base, apex, generators, resting on base, edge or corner.

Important questions:

- A regular hexagonal plane of 30 mm side rests on one side on HP with its surface inclined at 45° to HP. Draw its projections.
- A pentagonal prism rests on one of its base edges on HP with its axis inclined at 30° to HP. Draw its projections.
- A cone of base diameter 50 mm and axis 60 mm rests on a point of its base circle on HP with its axis inclined to HP and parallel to VP. Draw its projections.
- A square pyramid rests on a triangular face on HP. Draw its projections.

Method tip: solve every solid in two or three stages. First draw it in the simple position (axis perpendicular to HP), then tilt it, then turn it if it is also inclined to VP.

Unit 4: Sections of Solids and Development of Surfaces

Key definitions: section plane, apparent section, true shape of section, auxiliary inclined plane, development, parallel-line method, radial-line method.

Important questions:

- A hexagonal prism is cut by a plane inclined at 45° to HP passing through a given point on the axis. Draw the sectional top view and the true shape of the section.
- A cone is cut by a section plane parallel to one of its generators. Draw the sectional views and name the true shape (a parabola).
- Develop the lateral surface of a cylinder or a prism cut by an inclined plane (parallel-line method).
- Develop the lateral surface of a cone with base radius 30 mm and slant height 100 mm. Outline: the sector angle θ = 360° x r / l = 360 x 30 / 100 = 108°.
- Develop the lateral surface of a truncated pyramid (radial-line method).

Unit 5: Isometric Projection and CAD

Key definitions: isometric axes, isometric scale, isometric view and isometric projection, orthographic views, sectional view, computer-aided drafting.

Important questions:

- Explain the isometric scale. The isometric length is about 0.816 of the true length, so an isometric projection is smaller than an isometric view.
- Draw the isometric projection of a combination of solids, such as a cylinder resting on a square slab.
- Draw the front view, top view and side view of an object from a given pictorial (isometric) view.
- Draw the isometric view of an object from its given orthographic views.
- List common CAD commands (line, circle, offset, trim, extend, fillet, hatch, dimension) and explain the advantages of CAD over manual drafting.

How to score well in Engineering Graphics

- Practise on full-size sheets with real instruments. Speed only comes from repeated drawing.
- Keep construction lines thin and final outlines thick. Show hidden lines as dashes.
- Dimension every final view and label every point (a, a', b, b' and so on).
- Write the title, scale and method of projection on every question.
- Leave enough space on the sheet before you start. Many students lose marks because the drawing runs off the page.

Short-answer (2-mark) questions for Engineering Graphics

Short questions test definitions and one-line results. Practise answering each in two to four lines:

1. Define representative fraction.

2. What is the difference between a plain scale and a diagonal scale?
3. What is the eccentricity of a parabola? (Answer: 1.)
4. Define a cycloid.
5. Why is first-angle projection used in India?
6. What is the true length of a line?
7. What is a trace of a line?
8. How is a pyramid different from a prism?
9. What is the true shape of a section?
10. Which method of development is used for cones and pyramids? (Answer: the radial-line method.)
11. What is the ratio of isometric length to true length? (Answer: about 0.816.)
12. List four drawing commands in a CAD package.

A 7-day revision plan for Engineering Graphics

Use this plan in the last week before the exam. Adjust it to the units and weightage in your own syllabus.

- **Day 1 (Unit 1, Scales and Engineering Curves):** revise the definitions, then solve the numericals and one long answer from this unit without notes.
- **Day 2 (Unit 2, Projections of Points and Lines):** revise the definitions, then solve the numericals and one long answer from this unit without notes.
- **Day 3 (Unit 3, Projections of Planes and Solids):** revise the definitions, then solve the numericals and one long answer from this unit without notes.
- **Day 4 (Unit 4, Sections of Solids and Development of Surfaces):** revise the definitions, then solve the numericals and one long answer from this unit without notes.
- **Day 5 (Unit 5, Isometric Projection and CAD):** revise the definitions, then solve the numericals and one long answer from this unit without notes.
- **Day 6:** attempt one full three-hour practice paper made from these questions, or an official previous paper from your university archive.
- **Day 7:** go through your formula sheet, the short-answer list and every question you got wrong in the practice paper.

Frequently asked questions

Which topics in Engineering Graphics carry the most marks?

Projections of lines inclined to both planes, projections of solids, sections with true shape and isometric projection are usually the longest questions. Scales and curves are shorter but very regular.

How can I draw faster in the exam?

Practise each type of question on a full sheet several times, plan the layout before you begin, and draw construction lines lightly so you do not need to erase much.

Do I need to learn CAD for the exam?

If your syllabus includes CAD, expect short theory questions on commands and advantages, and sometimes a lab or practical component. Check your own syllabus for the weightage.

Are these questions from real past papers?

No. These are practice questions based on topics that are common in B.Tech syllabi. They are not verified past papers, and no question is promised to appear in your exam. Check your own university syllabus and official previous papers; AKTU students can use the AKTU old question paper archive.

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