

DIRECTORATE OF EDUCATION, GNCT OF DELHI

MID TERM EXAMINATION PRACTICE PAPER

CLASS XII

SESSION - 2026-27

ENGINEERING GRAPHICS (046)

Time allowed: 3 hours

Maximum Marks: 70

General Instructions:

- I. Question paper contains three sections Section-A, Section-B & Section-C respectively.
- II. All questions are compulsory.
- III. Use both sides of the drawing sheet, if necessary.
- IV. All dimensions are in millimetres.
- V. Missing and mismatching dimensions, if any, may be suitably assumed.
- VI. Follow the SP: 46 – 2003 revised codes. (with first angle method of projection)
- VII. In isometric projection of question 23 & 24, hidden edges or lines are not required to draw.

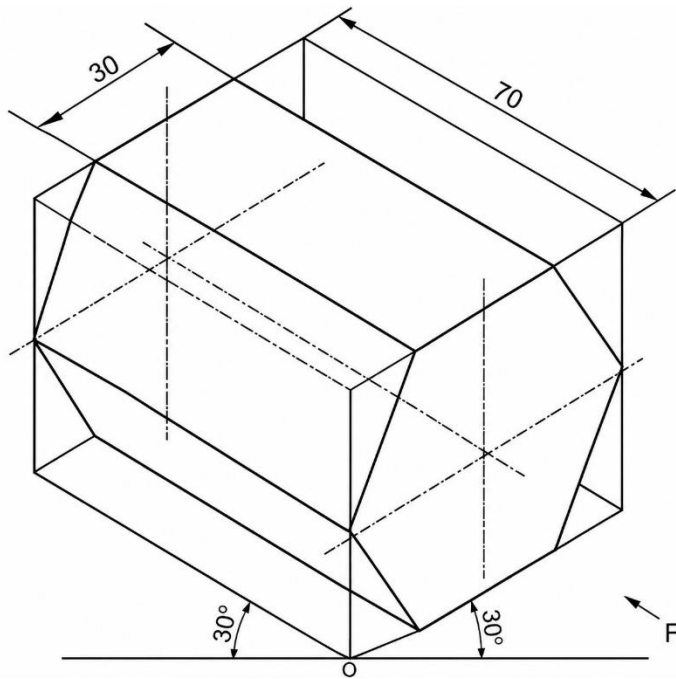
SECTION – A

Q. 1 to Q. 14: Answer the following Multiple-Choice Questions. Print the correct choice on your drawing sheet.

14x1=14

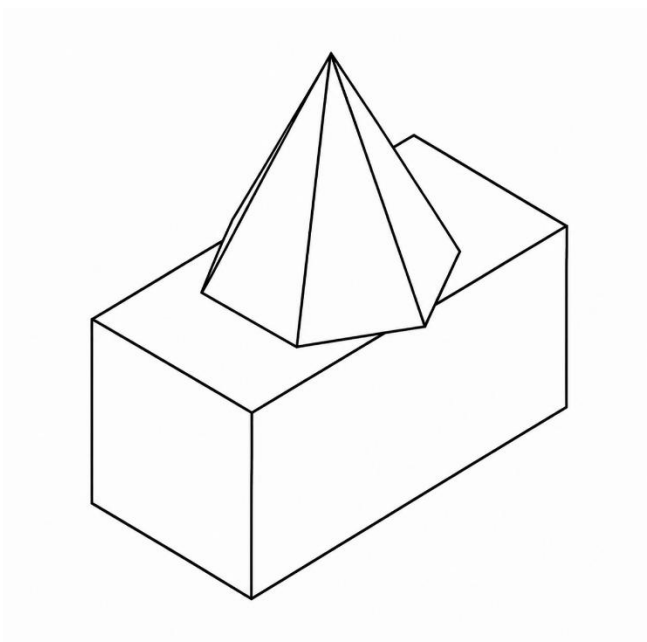
1. Which of the following projection method is not the type of axonometric projection?
 - a) Isometric Projection
 - b) Dimetric Projection
 - c) Trimetric Projection
 - d) Perspective Projection
2. The surface connecting crest and root is called:
 - a) Lead
 - b) Depth
 - c) Angle
 - d) Flank

3. Choose the **correct** option for the given figure:



- a) The hexagonal faces are parallel to VP.
- b) The hexagonal faces are perpendicular to VP.
- c) The hexagonal faces are parallel to HP.
- d) The hexagonal faces are parallel to both HP. and VP.

4. Choose the **correct** option for the given figure:

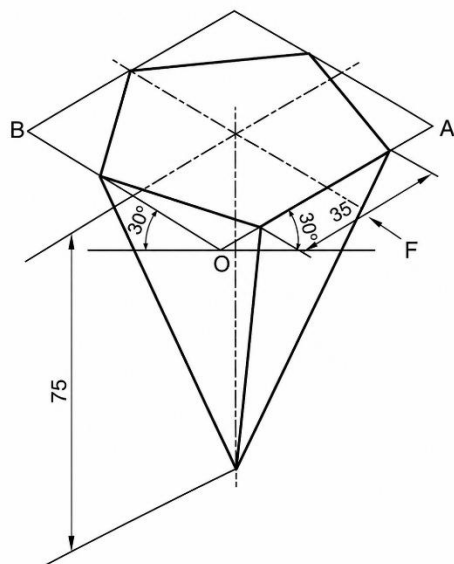


- a) A Horizontal Hexagonal Prism is resting on Vertical Square Prism.
- b) A Vertical Hexagonal Prism is resting on Horizontal Square Prism.
- c) A Vertical Hexagonal Pyramid is resting on Horizontal Square Prism.
- d) A Vertical Hexagonal Pyramid is resting on Vertical Square Prism.

5. The outer diameter of the head of the 90° flat counter sunk machine screw of size M20 is:

- a) Φ 36 mm
- b) Φ 40 mm
- c) Φ 20 mm
- d) Φ 30 mm

6. Choose the correct option for the given figure:



- a) The pentagonal face of the pyramid is parallel to VP.
- b) The pentagonal face of the pyramid is parallel to HP.
- c) The pentagonal face of the pyramid is perpendicular to HP.
- d) The pentagonal face of the pyramid is inclined at 30° with VP.

7. What is the inner diameter of plain washer when nominal diameter of bolt is D?

- a) $D+1$
- b) $0.8D$
- c) $0.9D$
- d) D

8. Which of the following is also known as Headless bolt?

- a) Flat Head Rivet
- b) Grub Screw
- c) Collar Stud
- d) Cheese head Screw

9. Identify the **correct** statements regarding the isometric projection:

- A. It is a type of axonometric projection.
- B. In this projection method, the visual rays converge toward a single point.
- C. Objects are represented at twice their actual size.
- D. Any line parallel to the three principal isometric axes is known as isometric line.
- E. This method requires drawing multiple views of the object.

Choose the **correct** answer from the options given below:

- a) A & B only
- b) A & D only
- c) C & D only
- d) D & E only

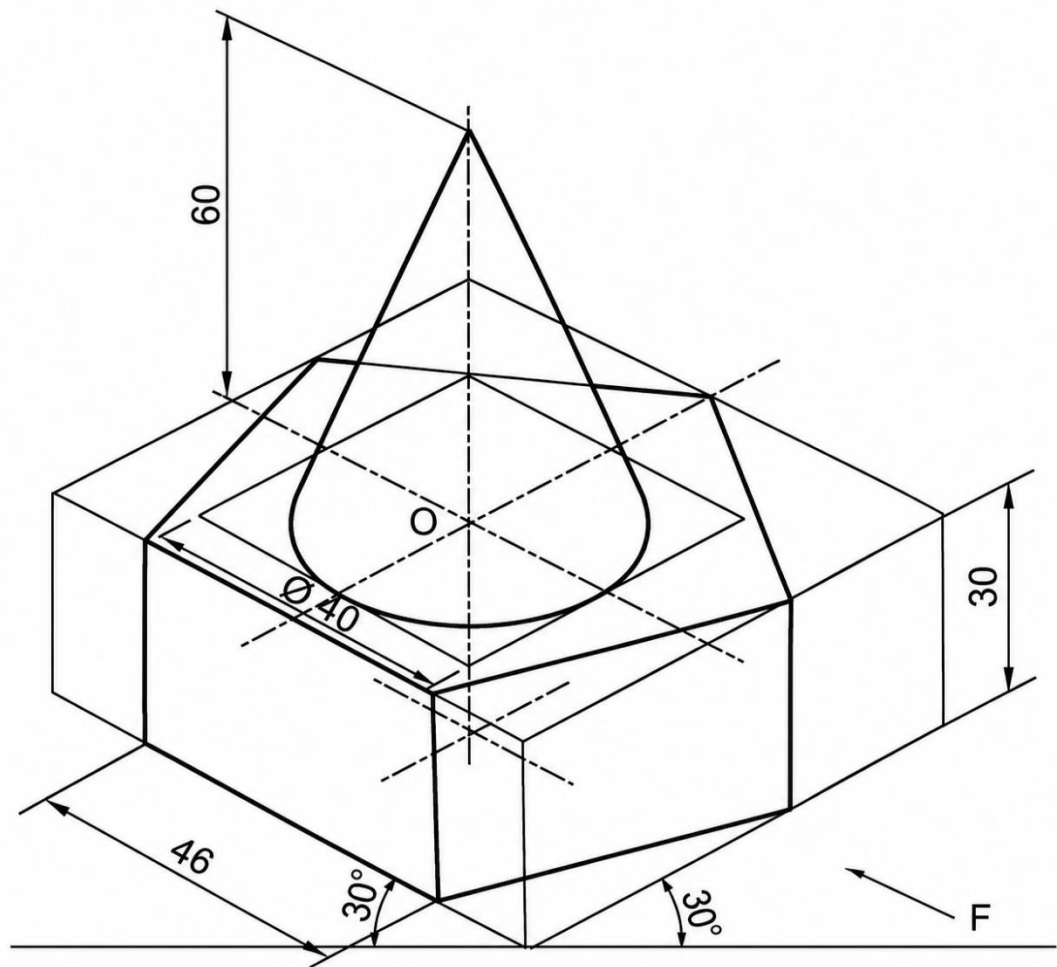
10. Identify the **correct** statements for the Rivets:

- A. A rivet consists of a head and a threaded shank.
- B. Riveting produces a permanent type of joint.
- C. The head of a rivet contains a slot for a screwdriver.
- D. Rivets include both metal end and nut end as essential parts.
- E. Rivets are extensively used in the construction of steel frameworks.

Choose the **correct** answer from the options given below:

- a) A & E only
- b) B & D only
- c) C & D only
- d) B & E only

11. Identify the **correct** statements for the given isometric projection:



- A. A cone is resting on a circular face of the prism.
- B. The true axial height of the prism is 30 mm.
- C. A square pyramid is resting on a pentagonal face of prism.
- D. The isometric axial height of the cone is 90 mm.
- E. A cone is resting on a pentagonal face of the prism.

Choose the **correct** answer from the options given below:

- a) A & B only
- b) D & E only
- c) A & C only
- d) B & E only

12. Match **Column-I** with **Column-II** regarding Isometric Scale:

Column- I (Elements of Isometric Scale)		Column- II (Components of Isometric Scale)	
1	Base Line of the scale	(A)	At an angle of 45° with base line
2	True length	(B)	At an angle of 30° with base line
3	Isometric length	(C)	At an angle of 90° with base line
4	Projection lines from true length to isometric length	(D)	At an angle of 0° with H.P.

Choose the **correct** answer from the options given below:

- a) 1-(D), 2-(B), 3-(C), 4-(A)
- b) 1-(B), 2-(D), 3-(A), 4-(C)
- c) 1-(D), 2-(A), 3-(B), 4-(C)
- d) 1-(C), 2-(A), 3-(D), 4-(B)

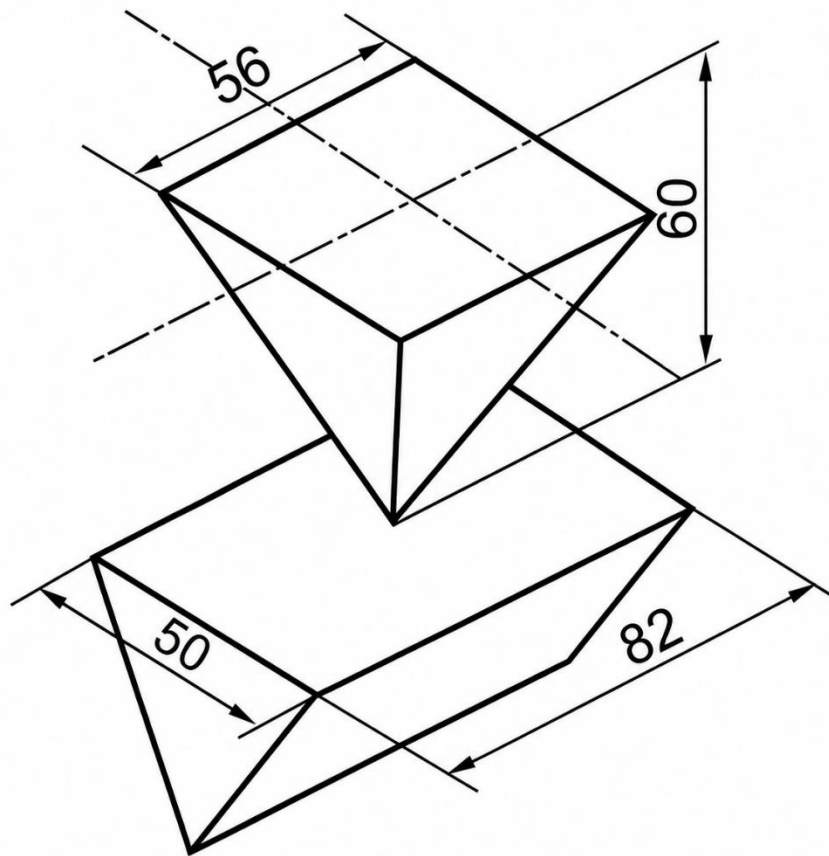
13. Match **Column-I** with **Column-II**:

Column- I (Description)		Column- II (Types of Thread profile)	
1	Crests and roots both are flat	(A)	Metric Thread Profile
2	Crests and roots both are semi-circular	(B)	BSW Thread Profile
3	Crests and roots both are rounded	(C)	Square Thread Profile
4	Crests are flat and roots are rounded	(D)	Knuckle thread profile

Choose the **correct** answer from the options given below:

- a) 1-(C), 2-(D), 3-(A), 4-(B)
- b) 1-(C), 2-(D), 3-(B), 4-(A)
- c) 1-(B), 2-(C), 3-(D), 4-(A)
- d) 1-(D), 2-(C), 3-(A), 4-(B)

14. Match **Column-I** with **Column-II** regarding given Isometric projection:



Column- I		Column- II	
(Dimensions)		(Measurement in isometric projection)	
1	Long edges of the prism	(A)	44.8 mm
2	Short edge of the prism	(B)	48.0 mm
3	Axis of the pyramid	(C)	40.0 mm
4	Base edge of the pyramid	(D)	65.6 mm

Choose the **correct** answer from the options given below:

- a) 1-(C), 2-(B), 3-(D), 4-(A)
- b) 1-(B), 2-(D), 3-(A), 4-(C)
- c) 1-(D), 2-(C), 3-(B), 4-(A)
- d) 1-(B), 2-(C), 3-(D), 4-(A)

SECTION – B

Q. 15 to Q. 18: Read the following paragraph and answer the questions given below:

4x1 = 4



The local heritage department of Consuegra decided to restore one of its famous windmills. Before beginning the restoration work, engineers prepared technical drawings of the structure. They observed that the lower portion of the windmill was cylindrical, while the roof was conical. To estimate the amount of paint required, they calculated the curved surface areas of both parts separately. The engineers also prepared orthographic projections to help workers understand the dimensions and shape of the structure. Accurate engineering drawings ensured that the historical appearance of the windmill was preserved during the restoration process.

15. Which projection would show the true circular shape of the cylindrical base?

- a) Front View
- b) Left Side View
- c) Top View
- d) Right Side View

16. The windmill structure (excluding blades) is an example of:

- a) A single solid
- b) A composite solid
- c) A regular polyhedron
- d) A prism

17. If you draw the isometric projection of the windmill using an isometric scale, the size of the windmill will reduce to (approximately):

- a) 100% of its actual size
- b) 90% of its actual size
- c) 80% of its actual size
- d) 70% of its actual size

18. The position of common axis of the conical floor and the cylindrical floor is:

- a) Parallel to each other
- b) Perpendicular to each other
- c) Co-axial
- d) Inclined to each other

Q. 19 to Q. 22: Read the following paragraph and answer the questions given below: 4x1=4

A manufacturing company was assembling control panels for industrial machines. The engineers had to choose suitable machine screws to securely fasten metal components. Three types of machine screws, labelled A, B, and C, were available, each having a different head shape but uniform threading along the entire length. Since machine screws are generally inserted into threaded or tapped holes, selecting the correct screw head was important for proper installation and maintenance. The engineers studied the screws carefully and prepared engineering drawings to identify their shapes and dimensions. Accurate selection ensured reliable fastening, ease of assembly, and long service life of the equipment.



19. The machine screw under the title 'A' shown in given image is a:

- a) Countersunk head screw
- b) Cheese head screw
- c) Round head Screw
- d) Grub screw

20. Machine screws are commonly screwed into:

- a) Square holes
- b) Triangular holes
- c) Threaded or tapped holes
- d) Hexagonal holes

21. In Engineering Graphics, a machine screw is classified as a:

- a) Fastener
- b) Measuring instrument
- c) Drawing instrument
- d) Cutting tool

22. The machine screw under the title 'B' shown in the given image is a:

- a) Round head screw
- b) Cheese head screw
- c) Countersunk head screw
- d) Grub screw

23. A sports equipment manufacturer is designing promotional material for a football tournament. The designer needs an isometric projection of a football, which can be approximated as a sphere of diameter 60 mm. Using the isometric scale, draw the isometric projection of the football. Clearly indicate the direction of viewing and show the required dimensions.

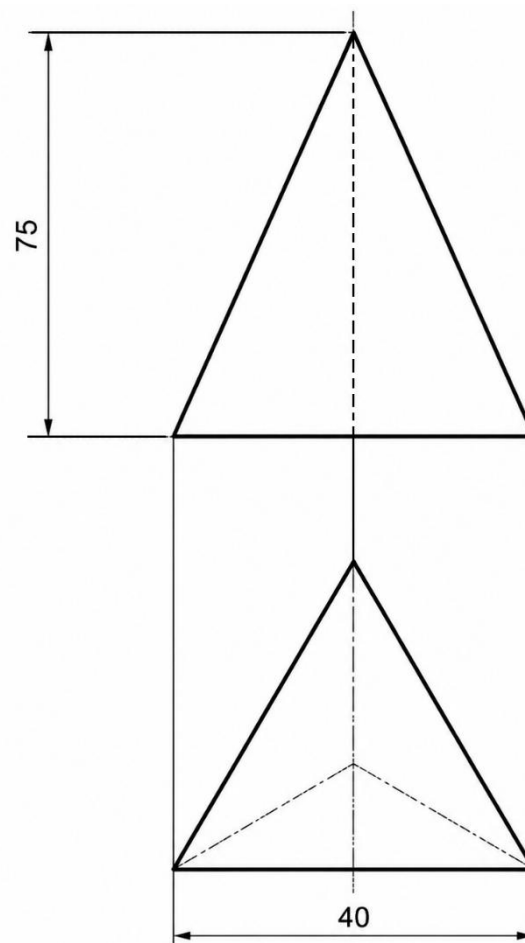
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OR

You are working as a design apprentice in a fabrication workshop. Your supervisor asks you to prepare an isometric projection of a hexagonal storage container used for storing industrial fasteners. The container is in the form of a regular hexagonal prism with its base resting on the floor (HP) and its axis perpendicular to the floor (HP) and parallel to the wall (VP). Two of its base edges are parallel to wall (VP). The container has a base edge of 40 mm and a height of 80 mm. Using the isometric scale, draw the isometric projection of the hexagonal prism showing all visible edges correctly. Indicate the direction of viewing, give the necessary dimensions.

14

24. The image is showing the orthographic projections of a solid. Using the isometric scale, draw the isometric projection of this solid. Show direction of viewing. Give dimensions. **13**



SECTION – C

25. Construct an isometric scale. **04**
26. Draw to the scale 1:1, the standard profile of the Square thread profile with the enlarged pitch as 50 mm. Give standard dimensions. **08**
27. Draw to the scale 1:1, the standard profile of the B.S.W. thread profile (External) with the enlarged pitch as 54 mm. Give standard dimensions. **09**

OR

Draw to the scale 1:1, the Front View, and Side View of a hexagonal headed bolt with diameter 30 mm. Keep its axis parallel to both H.P and V.P. Give standard dimensions. **09**