



Indian School Al Wadi Al Kabir

Assessment I (2026-2027)

Sub: ENGINEERING GRAPHICS (046)

Class: XII

Set - 1

Max. Marks: 70

Date: 20/09/2026

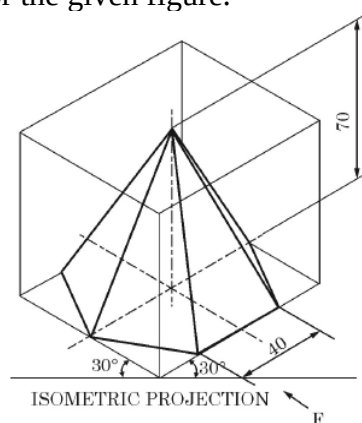
Time: 3 Hours

General Instructions:

- (i) Attempt all the questions.
- (ii) Use both sides of the drawing sheet, if necessary.
- (iii) All dimensions are in millimetres.
- (iv) Missing and mismatching dimensions, if any, may be suitably assumed.
- (v) Follow the SP: 46 – 2003 revised codes. (with the first angle method of projection)
- (vi) In question 23, hidden edges or lines are to be shown in views without section.
- (vii) In question 24, no hidden edges or lines are required.

SECTION - A

1. Which projection gives a pictorial representation in which all three principal axes are equally inclined? 1
(a) Orthographic Projection
(b) Perspective Projection
(c) Isometric Projection
(d) Oblique Projection
2. The solid that has a curved surface and two flat circular bases is a: 1
(a) Cone
(b) Sphere
(c) Cylinder
(d) Prism
3. An object placed above HP and behind VP lies in 1
(a) First Quadrant
(b) Second Quadrant
(c) Third Quadrant
(d) Fourth Quadrant
4. Select the correct statements for the given figure. 1



- (i) A hexagonal pyramid is placed with the axis perpendicular to V.P. and parallel to H.P.
- (ii) The solid is kept with a pair of base edges parallel to V.P.
- (iii) The solid is an example of a solid of revolution.
- (iv) The solid has a total of seven surfaces.

- (a) (i) and (iv) only
- (b) (i) and (ii) only
- (c) (ii) and (iv) only
- (d) (iii) and (iv) only

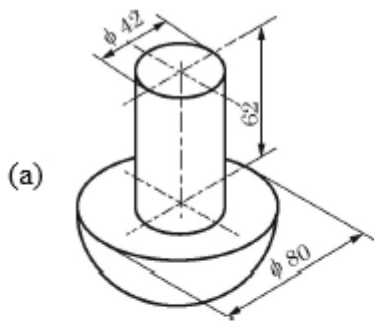
5. Chamfer is a conical round-off to the prism of the bolt head at:

1

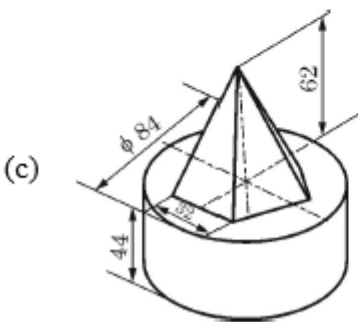
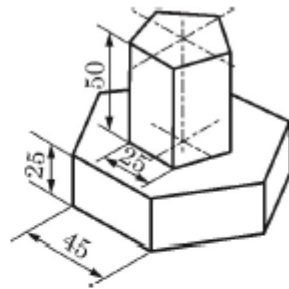
- (a) an angle of 15 degrees on the outer end face.
- (b) an angle of 30 degrees on the inner end face.
- (c) an angle of 15 degrees on both end faces.
- (d) an angle of 30 degrees on the outer end face.

6. Identify the combination of solids which is an example of a combination of polyhedron.

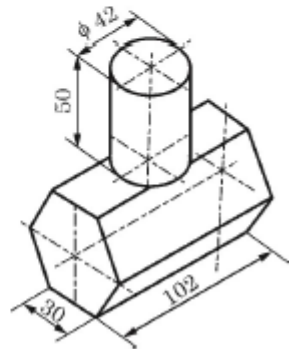
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(b)



(d)



7. Match LIST I with LIST II

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LIST I	LIST II
1. Isometric axes	i. A line not parallel to any of the isometric axes.
2. Isometric scale	ii. Foreshortened length
3. Isometric length	iii. Three axes equally inclined at 120° to each other
4. Non-isometric line	iv. Scale used to obtain reduced isometric lengths

- (a) 1-iii, 2-iv, 3-ii, 4-i
- (b) 1-i, 2-iii, 3-ii, 4-iv
- (c) 1-iv, 2-iii, 3-ii, 4-i
- (d) 1-ii, 2-iii, 3-iv, 4-i

8. The holes for the bolts in the sole plate of bearings are elongated towards the width to facilitate: 1

- (a) any misalignment while fitting.
- (b) larger bolts than recommended.
- (c) axial upliftment of the bolt.
- (d) reduction in the cost.

9. Select the correct option regarding a plain washer. 1

- (i) A circular plate having a square hole in its centre.
- (ii) The standard inner diameter is ' $d + 1$ '.
- (iii) Its outer diameter is ' $2d$ '.
- (iv) It is placed below the nut.

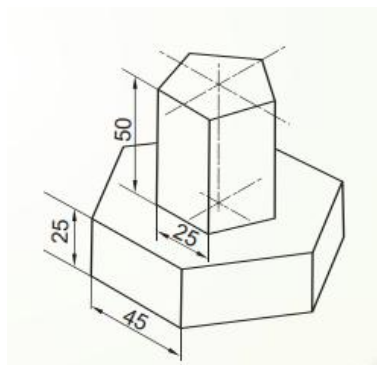
- (a) (i) and (ii) only
- (b) (ii) and (iii) only
- (c) (ii) and (iv) only
- (d) (iii) and (iv) only

10. Match LIST I with LIST II 1

LIST 1 (Fastener)	LIST II (Tool)
1. Screw	i. Allen key
2. Hexagonal socket head screw	ii. Spanner
3. Cotter	iii. Screwdriver
4. Nut-bolt	iv. Hammer

- (a) 1-iii, 2-iv, 3-ii, 4-i
- (b) 1-i, 2-iii, 3-ii, 4-iv
- (c) 1-iii, 2-i, 3-iv, 4-ii
- (d) 1-ii, 2-iii, 3-iv, 4-i

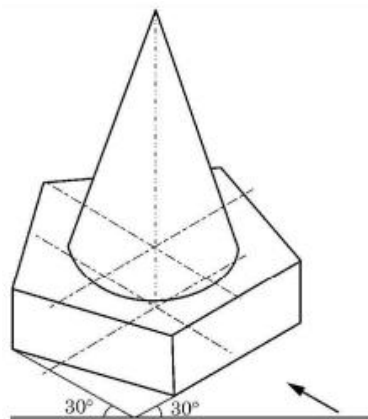
11. Choose the incorrect statement/s for the given figure. 1



- (i) The bottom solid is a hexagonal slab, and the top solid is a pentagonal prism.
- (ii) The axis of both solids is perpendicular to HP.
- (iii) The bottom solid is a hexagonal pyramid, and the top solid is a pentagonal pyramid.
- (iv) Both solids are hexagonal prisms.

- (a) (i) and (iv) only
- (b) (iii) and (iv) only
- (c) (i) and (iii) only
- (d) (iv) only

12. Select the correct options corresponding to the orientation of the given isometric projection. 1



- (i) A cone is kept on a pentagonal slab when one of the base edges of the prism is parallel to VP and nearer to the observer.
- (ii) A cone is kept on a pentagonal pyramid when one of its base edges is parallel to VP and away from the observer.
- (iii) A cone is kept on a pentagonal pyramid when one of the base vertices of the pyramid is at the rear.
- (iv) A cone is kept on a pentagonal prism when one of the base vertices of the prism is at the rear.

- (a) (ii) and (iv) only
- (b) (ii) and (iii) only
- (c) (i) and (iv) only
- (d) (i) and (iii) only

13. The portion of the shaft in the sleeve is called the-----.

- (a) Bush
- (b) Journal
- (c) Snug
- (d) Oil hole

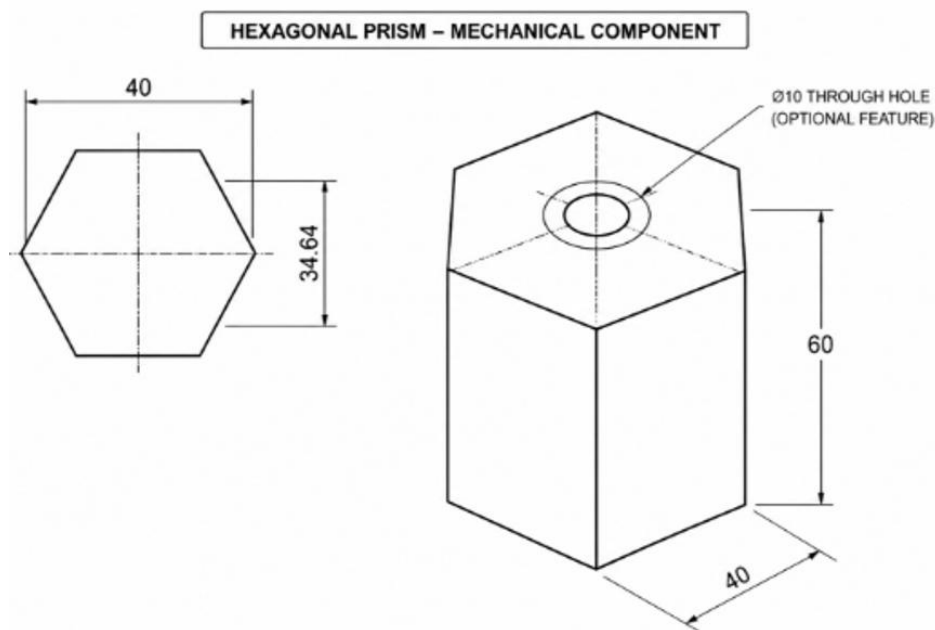
14. Two round rods are joined:
(a) by Sleeve and cotter joint
(b) by Gib and cotter joint
(c) by Tie rod joint
(d) by Flange joint

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SECTION - B

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

A student is asked to prepare **an** isometric projection of a hexagonal prism for a mechanical component. The prism has a regular hexagonal base and a given height. The student first constructs an **isometric scale** and then uses the reduced isometric lengths to construct the solid. While preparing the drawing, the student must correctly identify the isometric axes, transfer the dimensions, and accurately represent the hexagonal faces. The student also needs to understand that a line which is not parallel to an isometric axis cannot be measured directly using the isometric scale.



15. Why is an isometric scale used while preparing an isometric projection?
(a) To increase the dimensions of the object.
(b) To obtain the reduced isometric lengths.
(c) To convert all lines into horizontal lines.
(d) To draw only curved surfaces.
16. While constructing the hexagonal base, which statement is correct?
(a) All sides are drawn horizontally.
(b) The sides must be positioned with reference to the isometric axes.
(c) The hexagon is drawn using only vertical lines.
(d) The hexagon is drawn in true shape without considering isometric projection.
17. A line on the prism is not parallel to any of the three isometric axes. How should its length be obtained?
(a) Measure it directly along any isometric axis.
(b) Draw it using a protractor only.
(c) Locate its end points using construction lines and join them.
(d) Convert it into a vertical line.

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18. If the actual length of an edge is 40 mm, which length is approximately used when constructing it as an isometric projection?
- (a) 28.6 mm
 - (b) 30.0 mm
 - (c) 32.6 mm
 - (d) 40.0 mm

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

Rohan was working on assembling a small machine. While examining the machine drawing, he noticed different types of fasteners such as bolts, studs, machine screws, and rivets. His teacher explained that fasteners are used to join machine components and may be either temporary or permanent. Rohan also observed different forms of rivet heads used according to the requirement of the joint. Help him in resolving his queries:



19. Rohan found a bolt of 20×2 , where 2 represents:
- (a) Thickness of bolt
 - (b) Number of threads per mm
 - (c) Double-start thread
 - (d) Distance between two corresponding points on the adjacent threads.
20. A stud is generally used when:
- (a) Components have to be permanently joined.
 - (b) If there is insufficient space to accommodate the head of the bolt.
 - (c) Components are joined by welding.
 - (d) A rivet head has to be formed.
21. A machine component requires a permanent joint that cannot normally be dismantled without damaging the fastener. Which fastener would be most appropriate?
- (a) Bolt
 - (b) Stud
 - (c) Machine screw
 - (d) Rivet
22. The thickness of a flat-head rivet for diameter 'd' is:
- (a) 0.2 d
 - (b) 0.25 d
 - (c) 0.3 d
 - (d) 0.35 d

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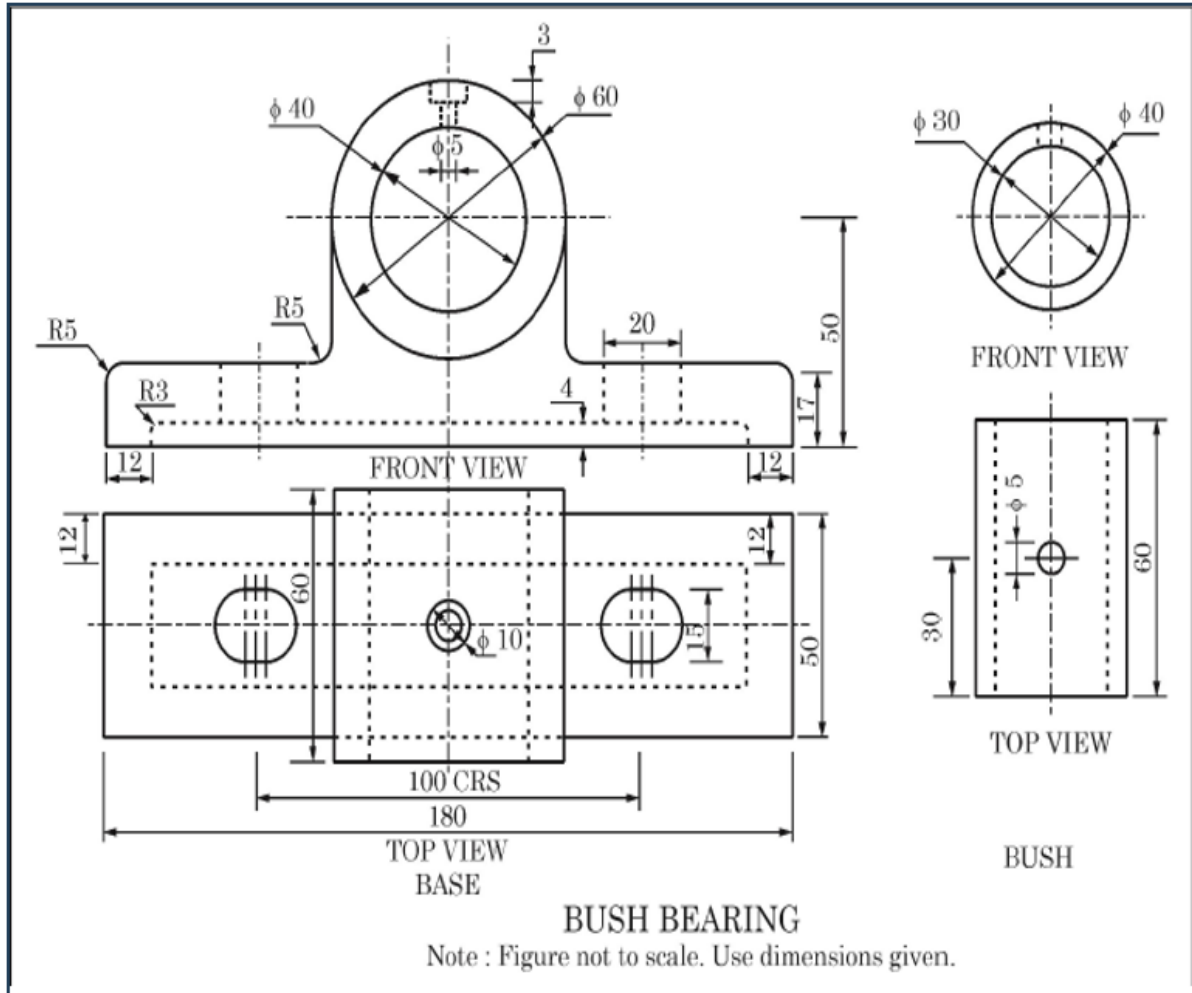
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23.(A) The figure shows the details of the parts of a Bush Bearing. Assemble all these parts correctly and then draw to scale 1: 1 the following views:

27

- (i) Front view, right half in section (13)
- (ii) Top view (8)
- (iii) Print the title and scale used. Draw the projection symbol. Give 6 important dimensions. (6)



OR

23 (B) The figure shows the assembly of a Sleeve and Cotter joint. Disassemble the parts correctly and then draw to scale 1:1 the following views of the components. Keep the same position of both the sleeve and rod with respect to HP and VP.

SLEEVE

- (i) Full sectional front view (8)
- (ii) Top view (6)

ROD A

- (i) Front view upper half in section (4)
- (ii) Left side view (3)
- (iii) Print the title and scale used. Draw the projection symbol. Give 6 important dimensions. (6)

