

CBSE Class 12 Engineering Graphics 2025 - Set 68



Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours

Maximum Marks: 70

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 or mismatching dimensions, if any, may be suitably assumed.
- (v) Follow the SP 46:2003 revised codes, with first-angle method of projection.
- (vi) In Question 24, no hidden edges or lines are required.
- (vii) In Question 23, hidden edges or lines must be shown in views without section.

Section A

Q.1 to Q.14 : Answer the following multiple choice questions. Print the correct choice on your drawing sheet.

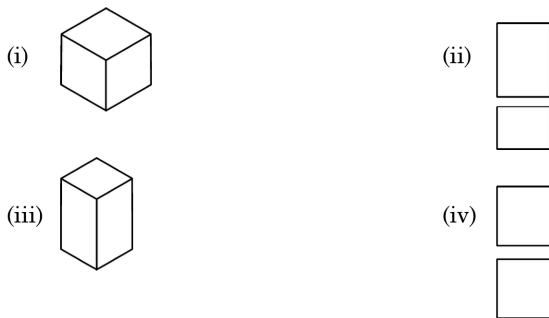
1. Lines composed of closely and evenly spaced short dashes, in a drawing, represents

- | | |
|-------------------|------------------|
| (A) Visible edges | (B) Hidden edges |
| (C) Hatching | (D) Pitch circle |

2. Sectioning of objects helps the engineers in clarifying _____.

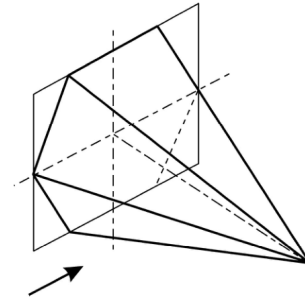
- | | |
|--|---|
| (A) The outlook of a complicated object | (B) The exterior details of a simple object |
| (C) The interior details of a complicated object | (D) The surfaces of a simple object |

3. Orthographic projection of a cube is shown as :



- | | |
|-----------|----------|
| (A) (i) | (B) (ii) |
| (C) (iii) | (D) (iv) |

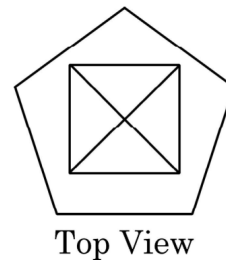
4. Select the correct statements for the given figure.



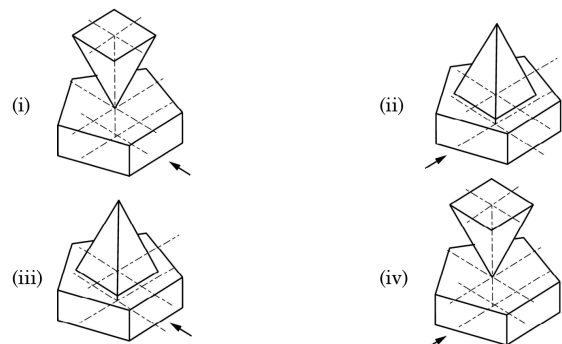
1. A horizontal pyramid is placed with its axis parallel to both H.P. and V.P.
2. The solid has three triangular faces in total.
3. A horizontal pyramid is placed with its axis perpendicular to V.P.
4. It is an example of polyhedron.

- | | |
|------------------------|-------------------------|
| (A) (i) and (iv) only | (B) (ii) and (iv) only |
| (C) (i) and (iii) only | (D) (ii) and (iii) only |

5.

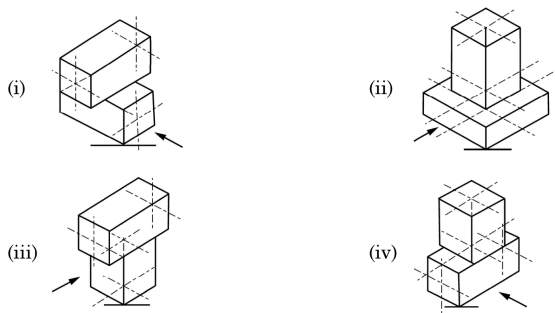


The above given top view corresponds to



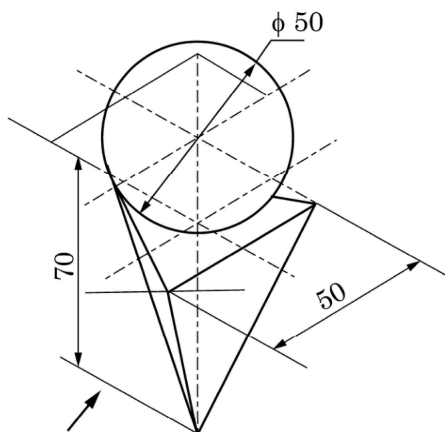
- | | |
|-----------|----------|
| (A) (i) | (B) (ii) |
| (C) (iii) | (D) (iv) |

6. Identify the correct figure which represents the isometric projection of a vertical square prism placed on a horizontal square slab.



- (A) (i) (B) (ii)
(C) (iii) (D) (iv)

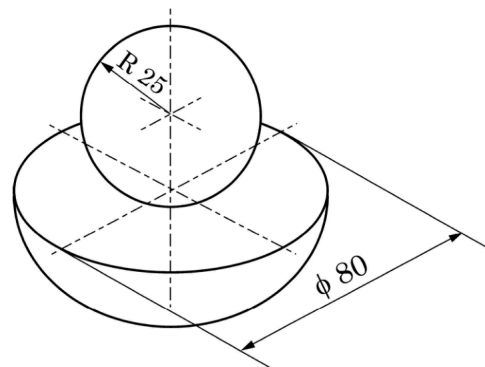
7. Select the correct option for the given isometric projection of combination of solids.



- The axis of pyramid is parallel to H.P. and one of its base edges is perpendicular to H.P.
- A sphere of diameter 70 mm is placed on the top face of a prism.
- The axis of pyramid is parallel to V.P. and one of its base edges is perpendicular to V.P.
- The axis of prism is perpendicular to V.P. and one of its base edges is parallel to H.P.

- (A) (iii) and (iv) only (B) (iii) only
(C) (ii) and (iii) only (D) (ii) only

8. Match the List-I with List-II for the given isometric projection of combination of solids :



List-I	List-II
(1) Top solid	(i) Hemisphere
(2) Bottom solid	(ii) Sphere
(3) Radius of sphere	(iii) 40 mm
(4) Radius of hemisphere	(iv) 25 mm

- (A) 1-(ii), 2-(i), 3-(iv), 4-(iii) (B) 1-(i), 2-(ii), 3-(iii), 4-(iv)
(C) 1-(ii), 2-(i), 3-(iii), 4-(iv) (D) 1-(i), 2-(ii), 3-(iv), 4-(iii)

9. A thread with vertical and parallel flanks is called

- (A) Square thread (B) Triangular thread
(C) Knuckle thread (D) V-thread

10. The length of the metal end of a plain stud of diameter 30 mm is

- (A) 10 mm (B) 24 mm
(C) 30 mm (D) 66 mm

11. Choose the correct option regarding screw threads.

1. A screw thread formed on the surface of a cylinder is known as taper thread.
2. In single start thread lead $L = 2P$.
3. In the practical use of the threads, clearance must be provided between the external and internal threads.
4. Root is the edge of the thread surface nearest to the axis in case of internal thread.

- (A) (i) and (ii) only (B) (ii) only
(C) (iii) and (iv) only (D) (iii) only

12. In a BUSH BEARING assembly, the inside of the bush is bored as a fit for _____.

- (A) Foundation bolt (B) Sole
(C) Shaft (D) Recess

13. Due to which of the following reason, usually pipes are made of standard length, not of desired length ?

- (A) Constraints of manufacturing (B) Policy of government
(C) Existence of friction (D) Leakage possibilities

14. Match the List-I with List-II :

List-I		List-II	
Front view of component of assembly		Name of the component	
(1)		(i)	Flange
(2)		(ii)	Bush of BUSH BEARING
(3)		(iii)	Gasket
(4)		(iv)	Bush of OPEN BEARING

- (A) 1-(iv), 2-(ii), 3-(iii), 4-(i) (B) 1-(ii), 2-(iii), 3-(i), 4-(iv)
(C) 1-(ii), 2-(i), 3-(iv), 4-(iii) (D) 1-(i), 2-(iv), 3-(iii), 4-(ii)

Section B

Q.15 to Q.18 : Read the following paragraph and answer the questions given below : $4 \times 1 = 4$

The given image is a fire-extinguisher. It is made up of a bigger cylindrical tank with a hemispherical portion on it. A very small cylindrical portion at the top has a valve assembly and a hose. Assume that the diameter of the hemispherical portion as 140 mm and height of the bottom cylindered portion as 350 mm.



15. The projections which are mostly used in the design process of this product is

- | | |
|---|--|
| (A) perspective projection and oblique projection | (B) isometric projection and orthographic projection |
| (C) perspective projection and axonometric projection | (D) oblique projection and multi view projection |

16. Cylinder and hemisphere are examples of

- | | |
|--------------------------|-----------------|
| (A) Solids of revolution | (B) Tetrahedron |
| (C) Solids of sectioning | (D) Polyhedron |

17. The total height in true scale, of the fire-extinguisher excluding the top valve assembly is

- | | |
|------------|------------|
| (A) 336 mm | (B) 420 mm |
| (C) 140 mm | (D) 350 mm |

18. If a label with “USE & CARE” instructions is to be pasted on the entire outer circumference of the bottom cylindrical portion, then the surface area of the label to be used will be _____.

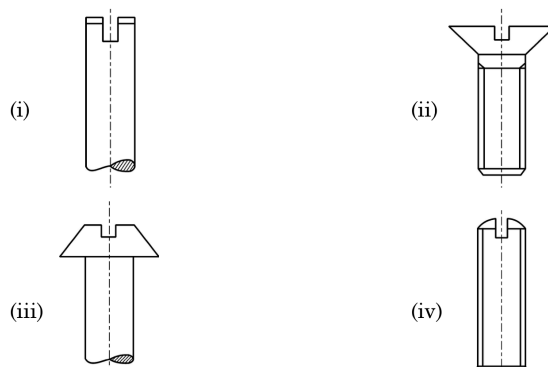
(Hint : Lateral surface area of cylinder = $2\pi rh$)

- | | |
|--------------------------|--------------------------|
| (A) 770 cm ² | (B) 1400 cm ² |
| (C) 3500 cm ² | (D) 1540 cm ² |

Q. 19 to Q. 22 : Read the following paragraph and answer the questions given below : $4 \times 1 = 4$

Grub screw, also known as set screw, is a type of fixing screw that is most often used to join one component or part securely to another. Grub screws are used to hold parts like sleeve, collar, gear etc. on a shaft to prevent relative motion. It is represented by thread size such as M8, M10 etc. Where M stands for metric thread and the numeral represents the diameter of screw in millimeter.

19. The front view of a vertical grub screw is represented by which of the following views ?



- | | |
|-----------|----------|
| (A) (i) | (B) (ii) |
| (C) (iii) | (D) (iv) |

20. The complete circle of ϕd and the incomplete circle of $\phi 0.8 d$ in the top view of a vertical grub screw with diameter ‘d’ are drawn to

- | | |
|---|--|
| (A) represent conventionally the external V-thread. | (B) attain the neatness of the figure. |
| (C) represent conventionally the internal V-thread. | (D) attain the 3D effect of the circles. |

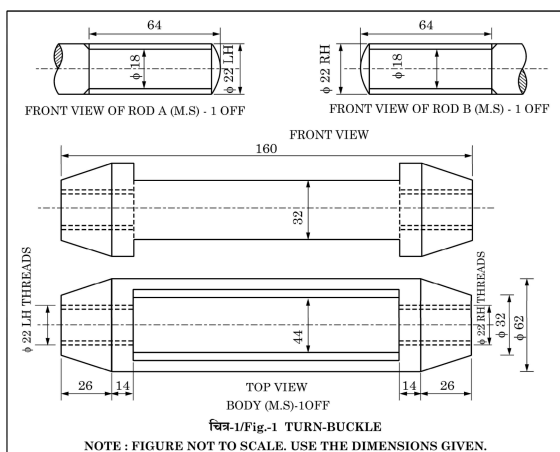
21. Grub screws are also known as

- (A) Counter sunk head screw (B) Pan head screw
(C) Headless screw (D) Threadless screw

22. Why grub screws are used to hold sleeve on a shaft ?

- (A) To reduce the misalignment of shaft.
(B) To prevent the relative motion.
(C) To reduce the production cost.
(D) To prevent the leakage of joint.

23(a). Fig. 1 shows the details of the parts of a TURN-BUCKLE. Assemble all these parts correctly and then draw to scale 1 : 1 its following views. Keep 54 mm threaded portion of each rod inside the body of turn-buckle.



An enlarged drawing is provided in the drawing references at the end of this paper.

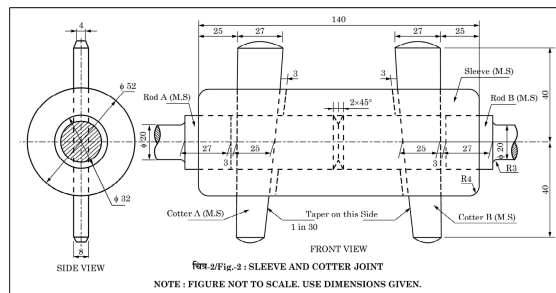
23(a)(i). Front view upper half in section

23(a)(ii). Right side view

23(a)(details). Print the title and scale used. Draw the projection symbol. Give 6 important dimensions.

OR

23(b). Fig. 2 shows the assembly of a SLEEVE AND COTTER JOINT. Disassemble the parts correctly and then draw to scale 1 : 1, its following views of the following components. Keeping the same position of both sleeve and cotter-B with respect to both H.P. and V.P.



An enlarged drawing is provided in the drawing references at the end of this paper.

23(b)(i)(a). SLEEVE

Front view lower half in section

23(b)(i)(b). SLEEVE

Left side view

23(b)(ii)(a). COTTER-B

Front view

23(b)(ii)(b). COTTER-B

Left side view

23(b)(details). Print the titles of both and the scale used. Draw the projection symbol. Give 6 important dimensions.

Section C

24(a). Construct an isometric scale.

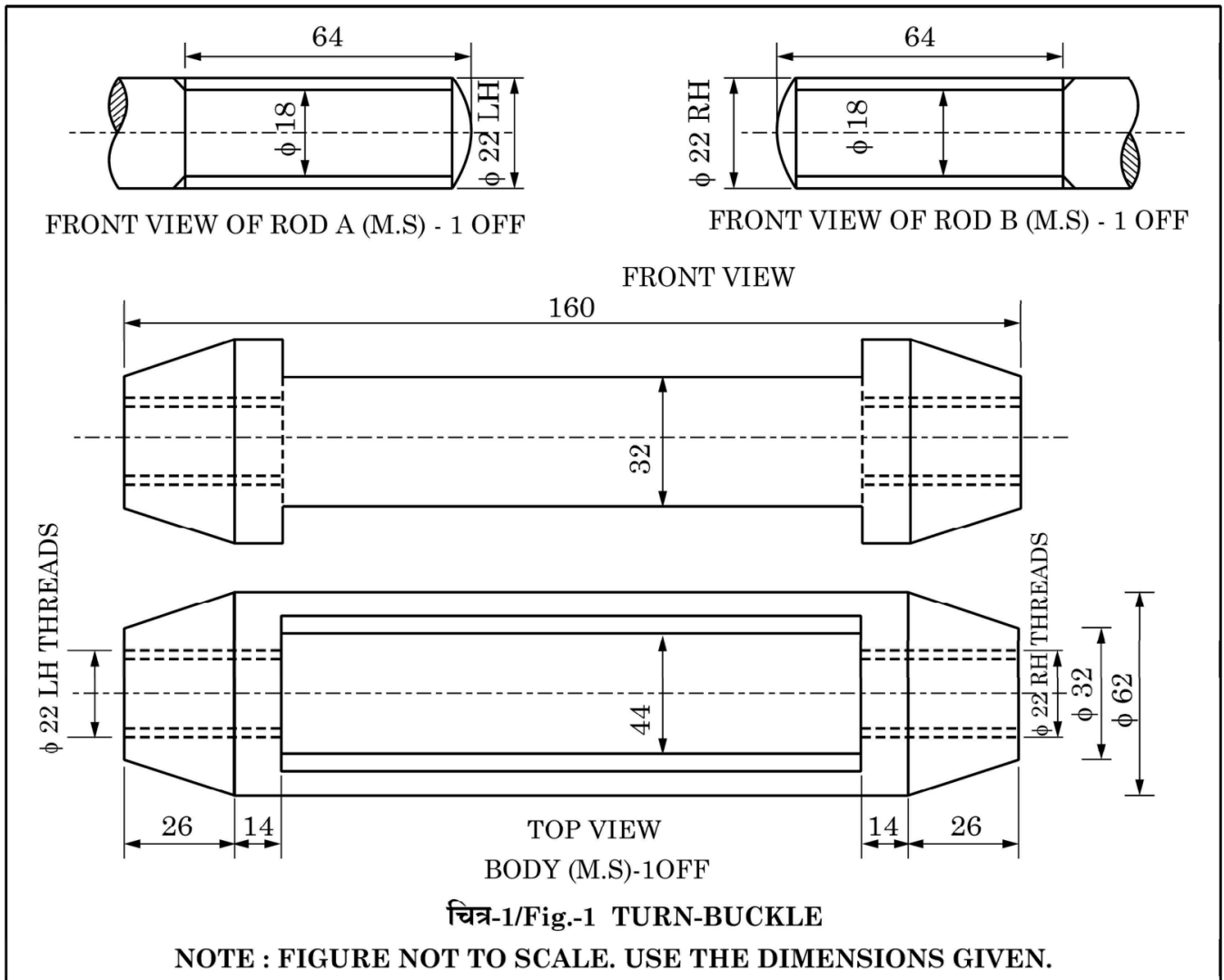
24(b). Draw the isometric projection of a triangular prism (base edge 35 mm, length 60 mm). It is placed on H.P with one of its long edges and its axis is perpendicular to V.P. Indicate the direction of viewing. Give all the dimensions.

25(a). Draw to scale 1 : 1, the standard profile of **EXTERNAL METRIC THREAD** taking enlarged pitch as 50 mm. Give standard dimensions.

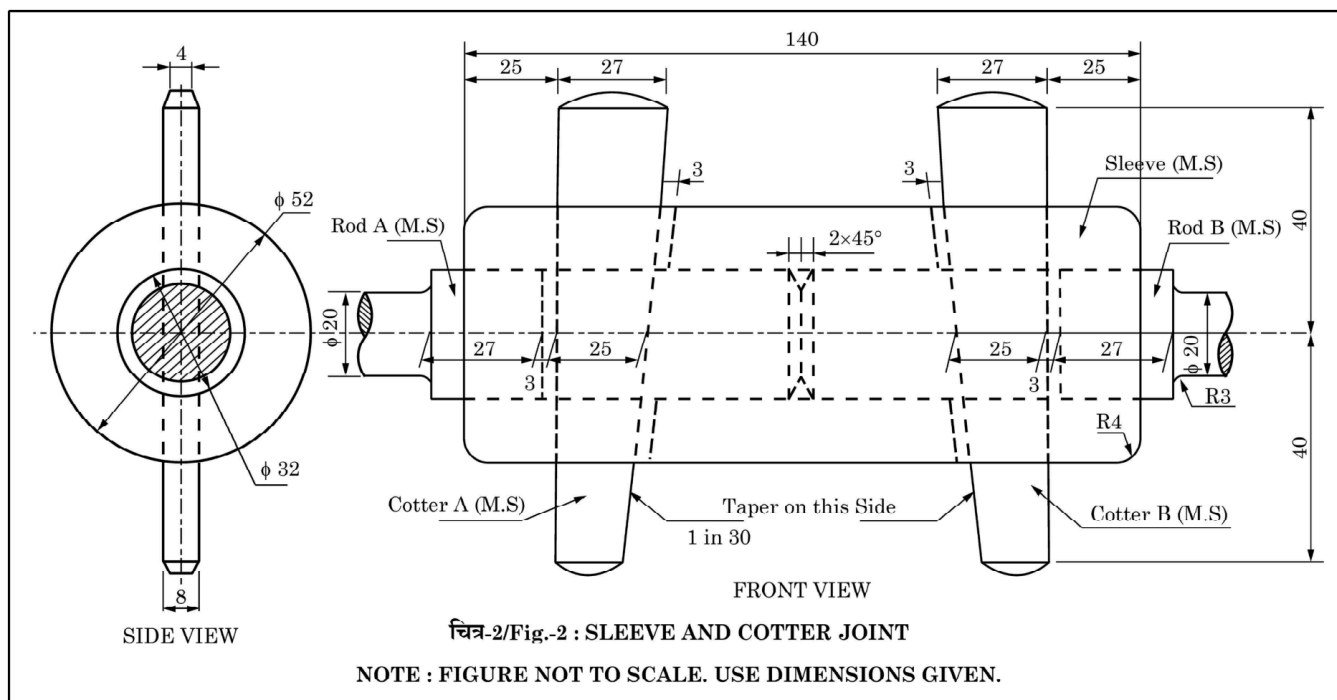
OR

25(b). Draw to scale 1 : 1, the front view of a **vertical hexagonal bolt** of diameter 25 mm. The bolt is resting on H.P with its hexagonal head on it. Give standard dimensions.

Question 23(a) — Figure 1



Question 23(b) — alternative — Figure 2



- End of Question Paper -