# Indian School Al Wadi Al Kabir
## Second Rehearsal Examination (2024-2025)

Class: XII | Subject: Engineering Graphics | Max. marks: 70
Date: 21/01/2025 | 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 millimeters.
(iv) Missing and 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 23, hidden edges or lines are to be shown in views without section.
(vii) In question 24, no hidden edges or lines required.

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

**14 × 1 = 14**

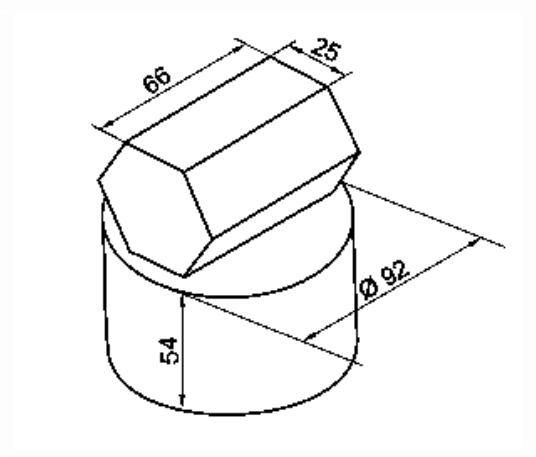
1.What is the primary unit of measurement for engineering drawings and design in the mechanical industries?

(a) Millimeter
(b) Meter
(c) Centimeter
(d) Decimeter

2. Which type of line has precedence over all other types of lines?

(a) Hidden lines
(b) Visible lines
(c) Dotted lines
(d) Centre lines

3. Select the correct option corresponding to the orientation of the given Isometric Projection:




(a) A pentagonal prism is kept centrally on the top surface of a cylinder with rectangular faces on it.
(b) A hexagonal prism is kept centrally on the top circular surface of a cylinder with its rectangular faces on it.
(c) A hexagonal pyramid is kept centrally on the top rectangular face of a hexagonal prism with its triangular faces on it.
(d) A hexagonal prism is kept centrally on the top of a cylinder with its hexagonal face on it.

4. What is the radius of arcs of Knuckle thread, if 'P' represents pitch?
(a) P/6
(b) P/2
(c) P/4
(d) P

5. The length of a bolt is its total length ----------.
(a) including the height and thickness of the bolt head
(b) excluding the height and thickness of the bolt head
(c) including the overall shank length
(d) excluding the chamfering arc of bolt head

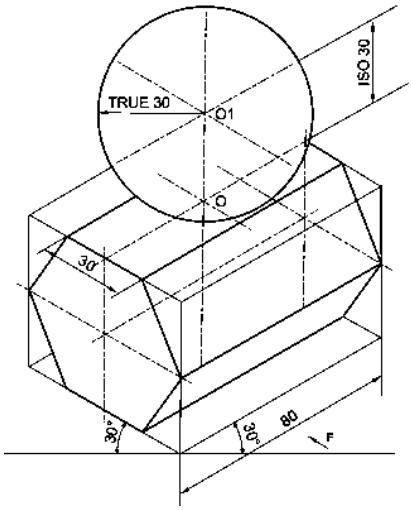
6. Which joint is used for rods of square cross section?
(a) Knuckle joint
(b) Sleeve and cotter joint
(c) Gib and cotter joint
(d) Socket and spigot joint

7. Match the LIST I with LIST II.

| **LIST 1** | **LIST II** |
|---|---|
| 1. Bushed bearing | i. Only one cotter is used |
| 2. Open bearing | ii. Higher load at medium speed |
| 3. Sleeve and cotter joint | iii. Shafts at slow speed |
| 4. Gib and cotter joint | iv. Two cotters are used |

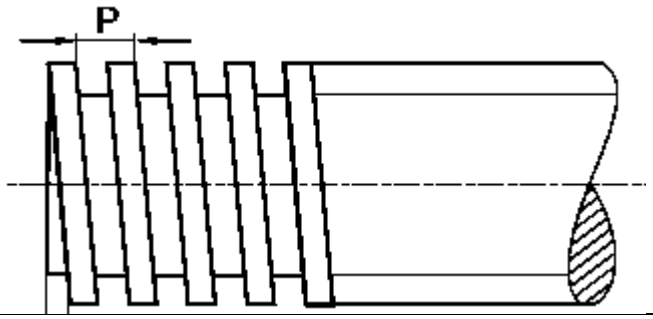
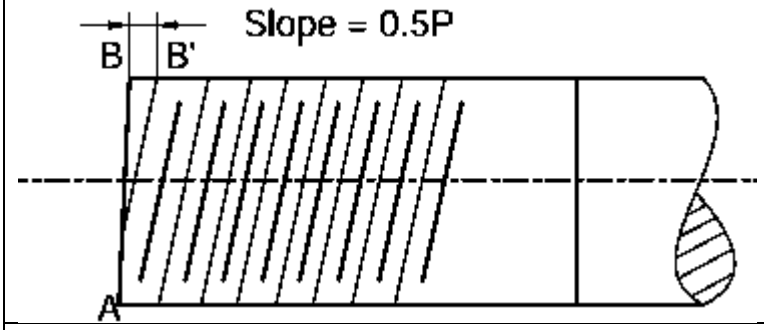
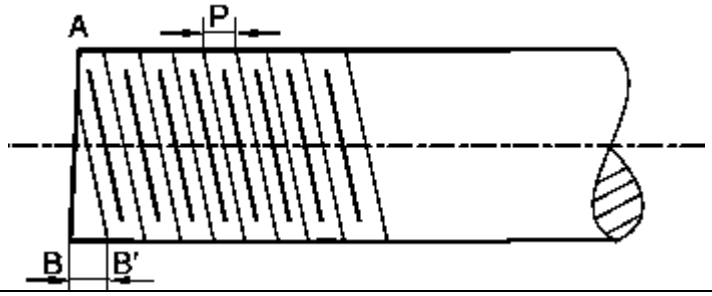
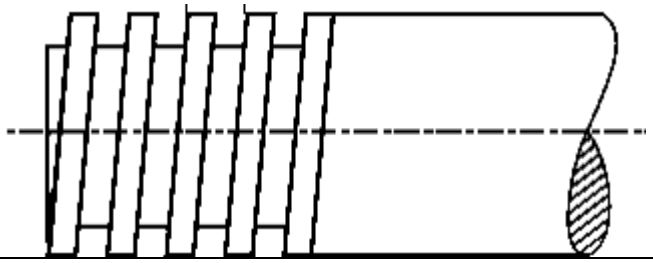
(a) 1-i, 2-iii, 3-ii, 4-iv
(b) 1-iii, 2-iv, 3-i, 4-ii
(c) 1-iv, 2-ii, 3-iii, 4-i
(d) 1-ii, 2-iii, 3-iv, 4-i

8. Select the correct option corresponding to the orientation of the given Isometric Projection:




(a) A hemisphere is kept centrally on the top hexagonal surface of a hexagonal prism with its curved surface on it.
(b) A sphere is kept centrally on the top hexagonal surface of a hexagonal prism with its curved surface on it.
(c) A sphere is kept centrally on the top rectangular face of a hexagonal prism with its curved surface on it.
(d) A hemisphere is kept centrally on the top rectangular face of a hexagonal prism with its curved surface on it.

9. Match the LIST I with LIST II.

| LIST 1 | LIST II |
|---|---|
| 1.   | i. LH – V- THREAD (EXTERNAL) |
| 2.   | ii. RH – V-THREAD (EXTERNAL) |
| 3.   | iii. LH SQUARE THREAD (EXTERNAL) |
| 4.  | iv. RH SQUARE THREAD (EXTERNAL) |

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

10.---------- consists of an elongated metal tube which is cylindrical in shape and has tapered ends.
(a) Bearing
(b) Cotter joint
(c) Pipe joint
(d) Turnbuckle

11. The joint used for tightening of electric overhead wires is ----------.
(a) Sleeve and cotter joint
(b) Flanged pipe joint
(c) Tie rod joint
(d) Gib and cotter joint

12. The flank angle for unified thread is ----------.
(a) 55 degree
(b) 90 degree
(c) 120 degree
(d) 60 degree

13. Which joint is useful to fasten connecting rod of a steam engine or marine engine?
(a) Bearings
(b) Pipe joint
(c) Gib and cotter joint
(d) Turnbuckle

14. In bushed bearing the base plate or sole is recessed up to----------.
(a) 8 mm
(b) 5 mm
(c) 3 mm
(d) 2 mm

## SECTION B

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

**4 × 1 = 4**

You are designing a water bottle with a cylindrical shape for a new product line. The bottle has a diameter of 70 mm and a height of 200 mm. You need to create the isometric projection to show the bottle's dimensions and ensure it will fit in a backpack compartment.

15. The base of the water bottle in isometric projection will be ----------.
    (a) circle
    (b) cone
    (c) parabola
    (d) ellipse
16. Which type of method must be used to construct the isometric projection of the base of the water bottle?
    (a) Box method
    (b) Four center method
    (c) Co-ordinate method
    (d) Trapezoid method

17. The isometric height of the water bottle will be ----------.
    (a) Less than 200 mm
    (b) More than 200 mm
    (c) Remains the same
    (d) 400 mm
18. The type of scale used to create the isometric projection of water bottle is called ----------.
    (a) True scale
    (b) Vernier scale
    (c) Nominal scale
    (d) Isometric scale

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

**4 × 1 = 4**

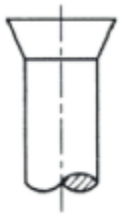
In the construction of a new bridge, engineers are tasked with designing and assembling a large steel framework using rivets to join different steel plates. The plates are thick, and the joints must withstand high tensile and shear stresses. The construction team has the option to choose between different types of rivet heads for their application. The types of rivet heads available are **flat, snap, pan, and countersunk**.

19. The most common and easiest form of rivet is ----------.
    (a) flat head rivet
    (b) pan head rivet
    (c) counter sunk head rivet
    (d) snap head rivet

20. In kitchen wares like pressure cooker and frying pan, the handle is joined to the body with the means of ----------.
    (a) Studs
    (b) Machine screws
    (c) Rivets
    (d) Keys

21. Calculate the outer diameter of the Flat head rivet, if d is given as 25 mm.
    (a) 37.5 mm
    (b) 40 mm
    (c) 50 mm
    (d) 25 mm

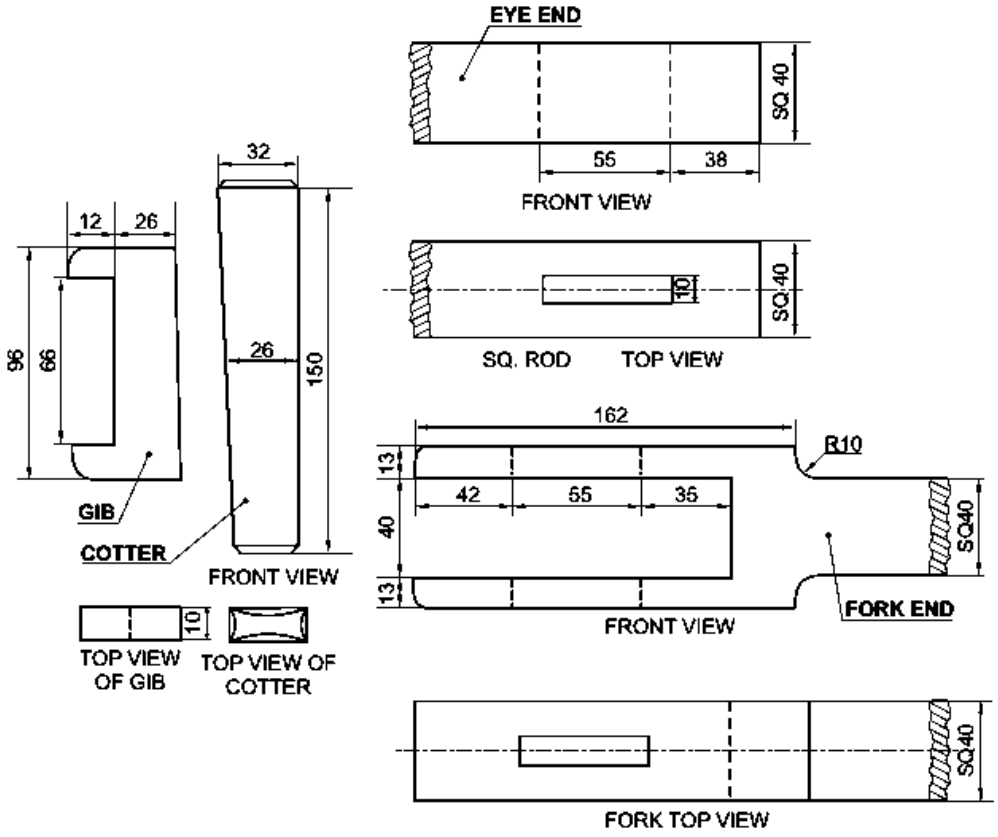
22. Identify the name of the Rivet head from the given figure?



    (a) Snap head rivet
    (b) Flat head rivet
    (c) CSK head rivet
    (d) Pan head rivet

23.(a) The figure shows the detail drawings of different parts of a Gib and Cotter Joint for joining two square rods. Assemble all the parts correctly and draw the following views to scale 1:1.

(i) Front view, upper half in section. (13)
(ii) Side view, viewing from the left-hand side. (8)
(iii) Print title, scale used and draw the projection symbol. Give '6' important dimensions. (6)



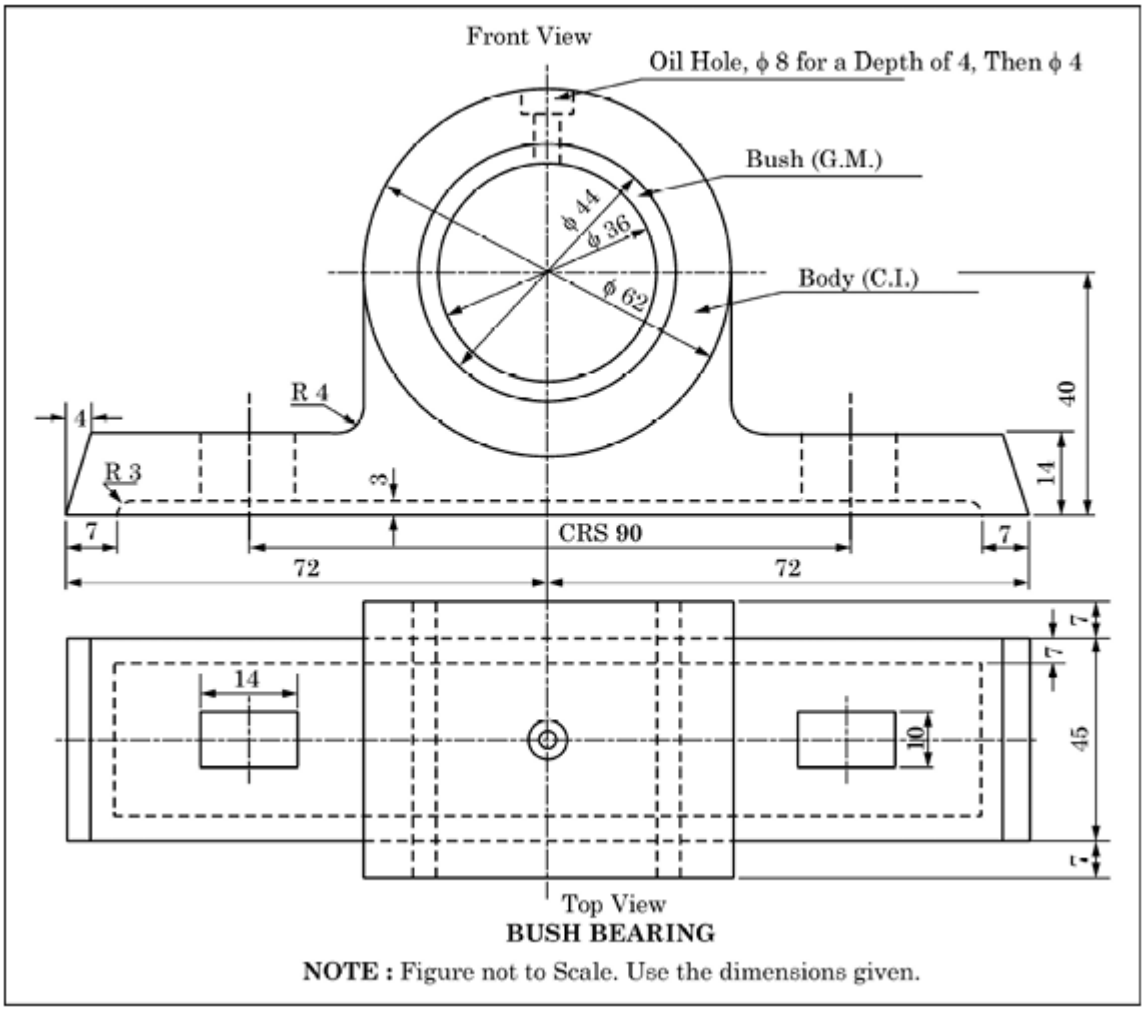

OR

23.(b) The figure shows the assembly of a Bushed bearing. Disassemble the parts correctly and then draw to scale 1:1 its following views of the following components. Keep the same position of both body and bush with respect to HP and VP.

(i) Body
- (a) Full sectional front view (8)
- (b) Left side view (7)

(ii) Bush
- (a) Front view (3)
- (b) Full sectional right side view (3)

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




**BUSH BEARING**

**NOTE :** Figure not to Scale. Use the dimensions given.

## SECTION C

24.(a) Construct an isometric scale $1 \times 4 = 4$

(b) A cone (base diameter 60 mm, height 70 mm) is resting on its base on H.P. Its axis is perpendicular to H.P. Draw its isometric projection. Show the axis and indicate the direction of viewing. Give all the dimensions. $1 \times 9 = 9$

$1 \times 8 = 8$

25.(a) Draw to scale 1:1, the standard profile of Metric thread (Internal) with enlarged pitch as 50 mm. Give standard dimensions.

**OR**

25. (b) Draw to scale 1:1, the front view and top view of a vertical Hexagonal Nut of diameter 25 mm. Give standard dimensions.