



INDIAN SCHOOL AL WADI AL KABIR
COMMON PREBOARD EXAMINATION
ENGINEERING GRAPHICS (046)

Class: XII
Date: 30/01/2024

Time: 3 Hours
Max. Marks: 70

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 no view of question 21, are hidden edges or lines required.
- (vii) In question 23, hidden edges or lines are to be shown in views without section.

20 x 1 = 20

SECTION – A

1. The type of projection which is not one plane drawing is -----

- a) Perspective projection
- b) Isometric projection
- c) Multiview Orthographic projection
- d) Oblique projection

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

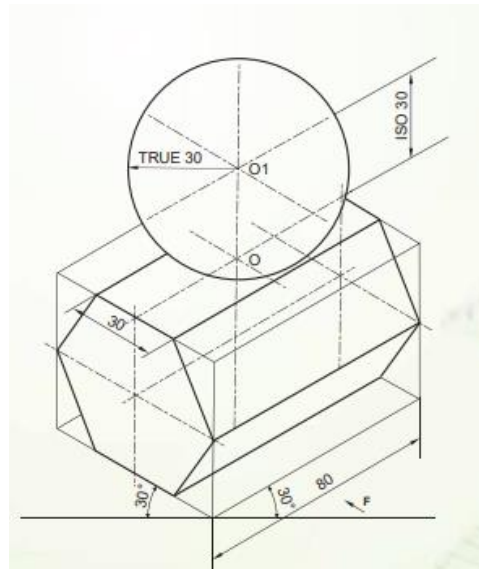
3. What is the radius of arcs of Knuckle thread, if 'P' represents pitch?

- a) $P/6$
- b) $P/2$
- c) $P/4$
- d) P

4. What is the thread angle in External Metric screw thread profile?

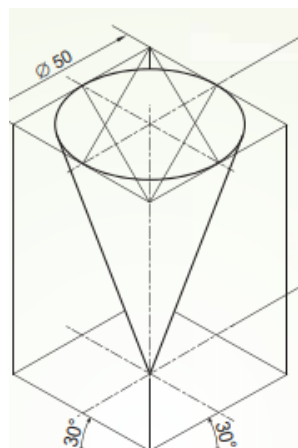
- a) 55 degree
- b) 65 degree
- c) 90 degree
- d) 60 degree

5. Select the correct option corresponding to the orientation of the given isometric projection.

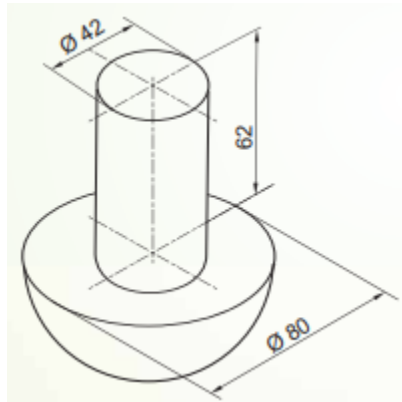


- a) Spherical dimensions cannot be drawn in isometric projection
- b) Spherical dimensions are foreshortened to 0.5 times in isometric projection
- c) Spherical dimensions are foreshortened approximately 0.8 times in isometric projection.
- d) Spherical dimensions are not foreshortened in isometric projection.

6. Select the correct option corresponding to the orientation of the given isometric projection.



- a) The solid is straight with its axis parallel to HP and perpendicular to VP.
 - b) The solid is inverted with its axis parallel to HP and perpendicular to VP.
 - c) The solid is straight with its axis perpendicular to HP and parallel to VP.
 - d) The solid is inverted with its axis perpendicular to HP and parallel to VP.
7. Select the correct option corresponding to the orientation of the given isometric projection.



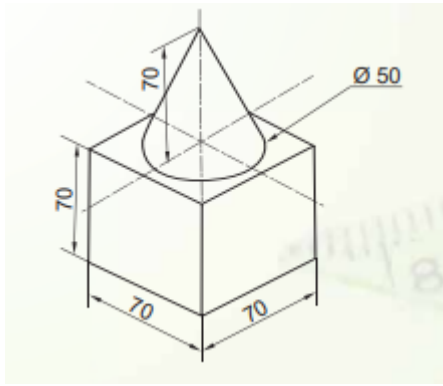
- a) A cylinder is placed centrally on a hemisphere with its common axis perpendicular to HP.
- b) A cylinder is placed centrally on a cylinder with its common axis perpendicular to HP.
- c) A cylinder is placed centrally on a hemisphere with its common axis perpendicular to VP.
- d) A cylinder is placed on a cylinder with its common axis perpendicular to VP.

8. Match the LIST I with LIST II

LIST I	LIST II
1.Flank	i. Prevention from rotation or sliding
2.Parallel thread	ii. Surface connecting crest and root
3.Taper thread	iii. Thread formed on the surface of cylinder
4.Grub screw	iv. Thread formed on the surface of cone

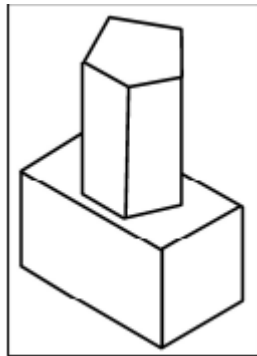
- a) 1-i, 2-iii, 3-ii, 4-iv
- b) 1-iii, 2-iv, 3-i, 4-ii
- c) 1-iv, 2-ii, 3-iii, 4-i
- d) 1-ii, 2-iii, 3-iv, 4-i

9. Choose the incorrect statement/s for the given figure.



- i) Bottom solid is a cube and top solid is a cone
 - ii) Axis of both solid is perpendicular to HP
 - iii) Bottom solid is a square prism and top solid is a cylinder
 - iv) The axis of cone will be less than true 70 mm.
- a) (i) and (iv) only
 - b) (iii) and (iv) only
 - c) (i) and (iii) only
 - d) (iii) only

10. Total number of rectangular faces in this figure is -----



- a) Six
- b) Eight
- c) Nine
- d) Zero

11.----- is a square prism provided with threaded hole.

- a) Hexagonal bolt
- b) Square nut
- c) Hexagonal nut
- d) Square bolt

12. ----- view of an object shows the width and depth dimensions.

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

13. ----- is used to connect large diameter pipes, especially cast-iron pipes.

- a) Tie rod joint
- b) Gib and cotter joint
- c) Flange pipe joint
- d) Sleeve and cotter joint

14. 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

15. Select the correct sequence of drawing the isometric projection of a vertical regular pentagonal pyramid placed centrally on top of a vertical cylinder.

A. Draw three principal axes at 30° , 90° and 30° to the horizontal base line and copy the length of sides of helping figure's enclosing box on the respective principal axis and height of the cylinder on the third principal axis to form an enclosing box (cuboid) for cylinder.

B. Draw the direction of viewing and do the dimensioning.

C. Draw the helping figure which is the base of vertical cylinder (circle, using isometric scale) and enclose it in a box, which is a rectangle.

D. Copy the coordinates of the center of circle from the helping figure to enclosing box of cylinder and complete the ellipse using four centre method above and below the box. Visible edges of cylinder are joined by thick lines and axis of cylinder is drawn with chain line.

E. Draw the enclosing box for the base of pentagonal pyramid on the top surface of the cylinder and construct a pentagon. Mark the height of the pentagonal pyramid (apex) from the centre of top surface of cylinder at 90° . Join the generators of the pentagonal pyramid.

- a) B, D, A, C, E
- b) A, B, C, D, E
- c) C, A, D, E, B
- d) D, E, B, A, C

Q16. to 20: Read the following paragraph and answer the questions given below

International fastener expo 2023 was being held at Lal Mahal, Pune. This year, everything you need to know about rivets, studs, machine screws and permanent mechanical fastener technologies was available at the International Fastener Expo.

Rohit went for the expo with his father and saw some machine parts which he already learnt in his engineering graphics class.

16. The basic difference between a machine screw and a rivet is-----

- a) The body of a machine screw has octagonal cross section whereas the body of a rivet has pentagonal cross section.
- b) Machine screws are temporary fasteners whereas rivets are permanent fasteners
- c) Machine screws are used for joining only pipes whereas rivets are used for joining shafts
- d) Machine screws are useful in all the industrial applications whereas rivets are useful only in boilers.

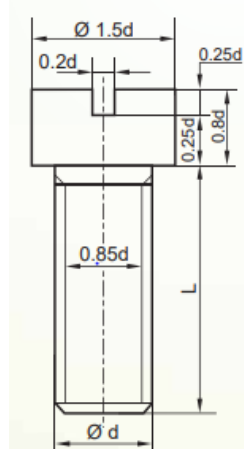
17. The nut end side in a plain stud is calculated by -----

- a) $2d+6$
- b) $0.4d$
- c) d
- d) $1.5d$

18. The outer diameter of head in 60-degree CSK head rivet of diameter 20mm is -----

- a) 20
- b) 30
- c) 36
- d) 14

19. Identify the name of the machine part from the given figure?



- a) Pan head rivet
- b) Cheese head screw
- c) Grub screw
- d) Snap head rivet

20. The top view of a vertical Pan head rivet comprises of -----

- a) two visible squares.
- b) one visible and one invisible (dotted) circle
- c) one visible and one invisible (dotted) square
- d) two visible circles.

SECTION B

1 x 5 = 5

21.a) Construct an isometric scale

1x10 =10

b) Draw the isometric projection of a hexagonal pyramid having base edge of 40 mm and axis 70 mm resting on its base keeping two of its base side parallel to the V.P.

1 x 8 = 8

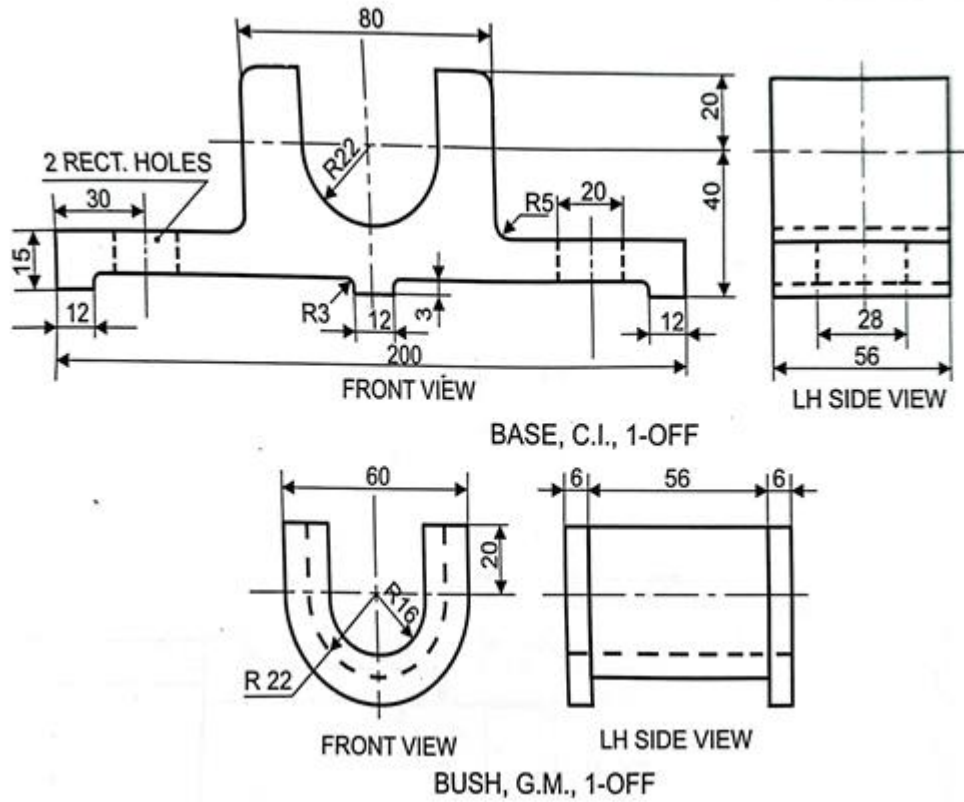
22. Draw to scale 1:1, standard profile of B.S.W. thread, taking pitch = 50 mm. Give standard dimensions.

OR

Draw to scale full size the Front View and Top View of a square nut of diameter 25mm, keeping its axis vertical with the diagonal on the square face parallel to V.P.

23. The figure shows the details of the parts of an Open bearing. Assemble these parts correctly and then draw the following views to scale 1:1.

- a) Front view left half in section **(14)**
- b) Left hand side view **(7)**
- c) Print title, scale used, projection symbol and give all dimensions. **(6)**



OPEN BEARING DETAILS

OR

Figure 2 shows the assembly of a 'Gib 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 with respect to H.P and V.P. as given:

a) FORK END

(i) Front View, Upper half in section. (9)

(ii) Top View. (5)

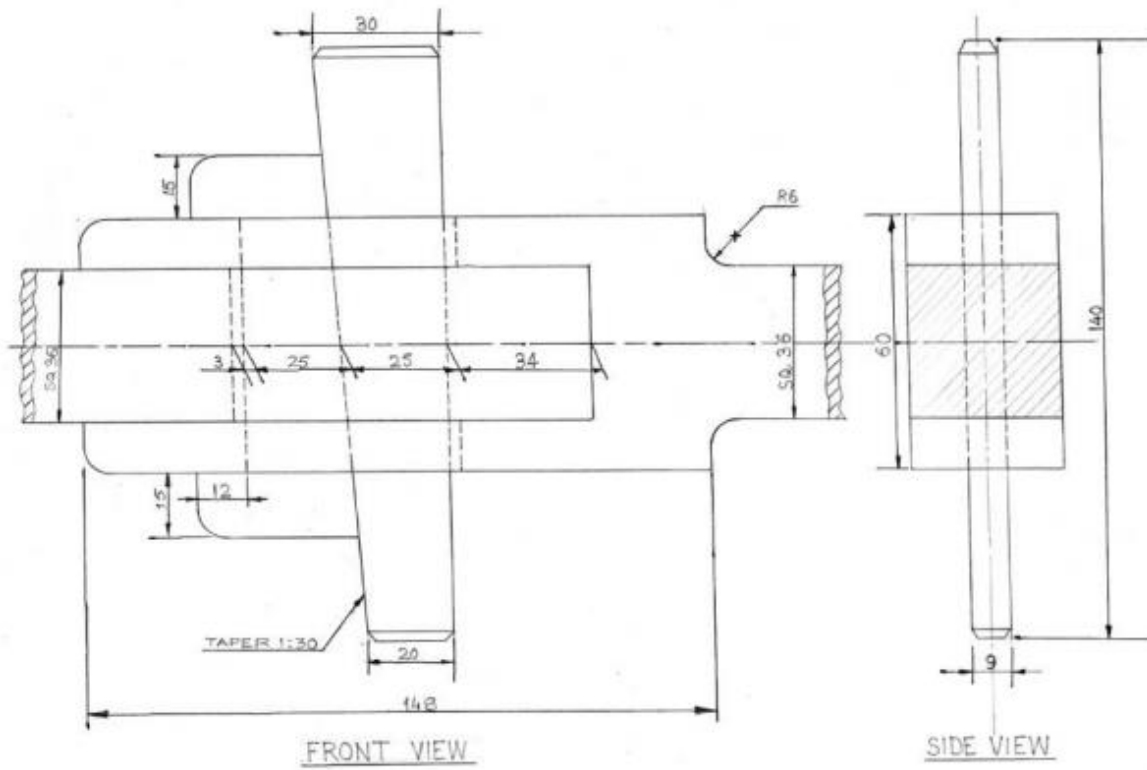
b) GIB

(i) Front View. (4)

(ii) Side View. (3)

(iii) Print the titles of both and scale used. Draw the projection symbol.

Give 6 important dimensions. (6)



GIB AND COTTER JOINT

Figure 2