CBSE Class-12th ENGINEERING GRAPHICS
Outside Delhi Set-4 2017

General Instructions:

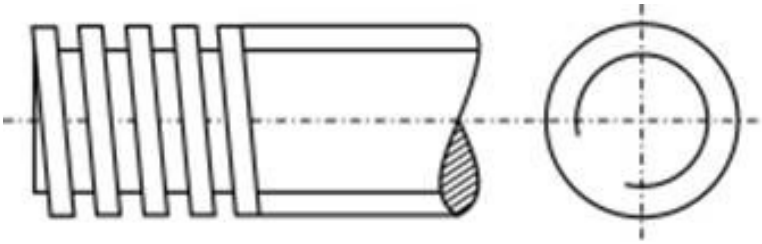
1. Attempt all the questions.
2. Use both sides of the drawing sheet, if necessary.
3. All dimensions are in millimeters.
4. Missing and mismatching dimensions, if any, may be suitably assumed.
5. Follow the SP : 46-2003 revised codes (with first angle method of projection).
6. In no view of question 2, hidden edges or lines are required.
7. In question 4, hidden edges or lines are to be shown in views without section.
8. Give your answers according to questions.

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

(i) The dimension lines are drawn as ?

(a) Small dash lines (b) Chain lines (c) Wavy lines (d) Thin continuous lines

(ii) The figure given below shows the conventional representation of which threads?



(a) External square threads (b) External V-threads (c) Internal square threads (d) Internal V-threads

(iii) Why Gib head is provided on a Gib head key ?

(a) To facilitate the withdrawal of the key without disturbing the setting of the Hub.

(b) For lubrication purpose

(c) For the aesthetic sense

(d) To reduce the cost of manufacture

(iv) What is the purpose of an Open bearing ?

(a) To join two pipes (b) To support the moving shaft (c) To join two shafts (d) To

support the pipes

(v) Solid cast iron pulley is attached to the shaft by means of a _____.

(a) Rivet (b) Bolt (c) Key (d) Stud

Ans. (i) (d) or Thin Continuous Lines.

(ii) (a) or External square threads.

(iii) (a) or To facilitate the withdrawal of the key without disturbing the setting of the Hub.

(iv) (b) or To support the moving shaft.

(v) (c) or Key.

2. (i) Construct an isometric scale.

Ans. Marking of divisions of 10 mm, including division of first part of 1 mm on true length.

(ii) Projections from scale 1:1 to get points on isometric scale, construction of isometric scale.

(iii) Printing 'True Length/Scale 1:1', 'Isometric Length/Isometric Scale' and marking angles of $30° \& 40°$.

(ii) A frustum of triangular pyramid (base edge 40 mm, top edge 30 mm and height 60 mm) is kept with its axis perpendicular to H.P. One of the base edges is nearer to the observer and is parallel to V.P. Draw its isometric projection. Show the axis and indicate the direction of viewing. Give all dimensions.

Ans. ISOMETRIC PROJECTION OF A FRUSTUM OF A TRIANGULAR PYRAMID

(i) Drawing helping figure of both triangles.

(ii) Drawing isometric triangle, on top and at the base.

(iii) Drawing three slant edges.

(iv) Marking the vertical axis (½) and direction of viewing (½).

(v) Dimensions.

(iii) A vertical hexagonal prism (base edge 20 mm, height 70 mm) is placed centrally on the top circular face of a hemisphere (Diameter 80 mm). Two base edges of the prism are perpendicular to V.P. The common axis is perpendicular to H.P. Draw the isometric projection of the combination of solids. Show the common axis and indicate the direction of viewing. Give all dimensions.

Ans. ISOMETRIC PROJECTION OF A HEXAGONAL PRISM PLACED, CENTRALLY, ON A HEMISPHERE

HEMISPHERE

(i) Drawing isometric ellipse (2 ½) along with centre lines (½).

(ii) Drawing semicircular portion of hemisphere.

(iii) Marking the vertical axis.
(iv) Dimensions.
HEXAGONAL PRISM
(i) Drawing helping figure.
(ii) Drawing both isometric pentagons.
(iii) Drawing vertical edges.
(iv) Marking the vertical axis (½) and direction of viewing (½).
(v) Dimensions.

3. (i) Draw to scale 1 : 1 the front view and top view of a Hook bolt of size M20, keeping the axis vertical. Give standard dimensions.
OR Draw to scale 1 : 1, the sectional front view of a Single riveted lap joint for joining the plates of thickness 16 mm. Give standard dimensions.
Ans. (i) HOOK BOLT
FRONT VIEW:
(i) Threaded and unthreaded portions of cylindrical shank.
(ii) Head of bolt with square neck.
TOP VIEW:
(i) Rectangle with one vertical line.
(ii) Two circles as per convention.
(iii) Standard dimensions
[OR]
SINGLE RIVETED LAP JOINT
(i) Drawing both the plates, including 10° taper at ends.
(ii) Drawing both rivet heads (Any type).
(iii) Drawing hatching lines.
(iv) Standard dimensions.

(ii) Keep the axis vertical, sketch freehand the front view of a Hexagonal socket head screw of size M10. Give standard dimensions.

OR

Keep the axis parallel to both H.P. and V.P. sketch freehand the front view and side view of a Plain stud of diameter 20 mm. Give standard dimensions.

Ans. HEXAGONAL SOCKET HEAD SCREW

Front view with its axis perpendicular to H.P.

(i) Drawing the head.

(ii) Drawing the shank with threaded and unthreaded portions.

(iii) Standard dimensions.

[OR]

PLAIN STUD

(i) Front view with its axis parallel to both H.P. and V.P.

(ii) Side view.

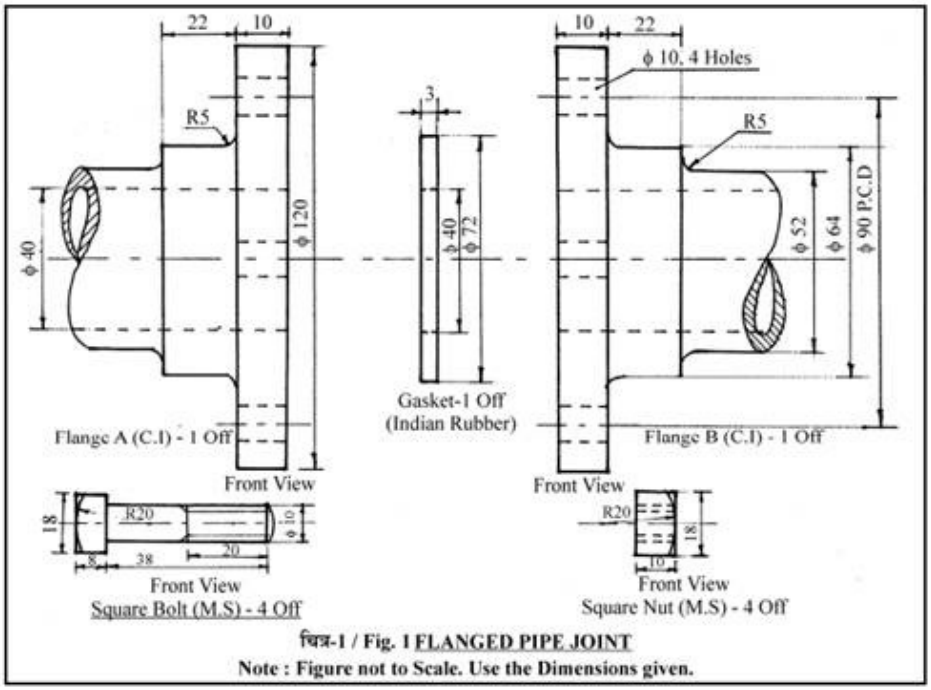
(iii) Standard dimensions

4. Figure-1 shows the details of the parts of a Flanged Pipe Joint. Assemble these parts correctly and then draw to scale 1 : 1 its following views:

(i) Front view lower half in section.

(ii) Side view looking from right.

Print the title and the scale used. Draw the projection symbol. Give 6 important dimensions.



चित्र-1 / Fig. 1 FLANGED PIPE JOINT

Note : Figure not to Scale. Use the Dimensions given.

OR

Figure-2 shows the assembly of a sleeve and cotter joint. Disassemble the parts correctly and then draw its following views of the components to scale 1 : 1, keep the same position of both sleeve and cotter-A with respect to both H.P. and V.P.

(i) Sleeve :

(a) Front view, upper half in section.

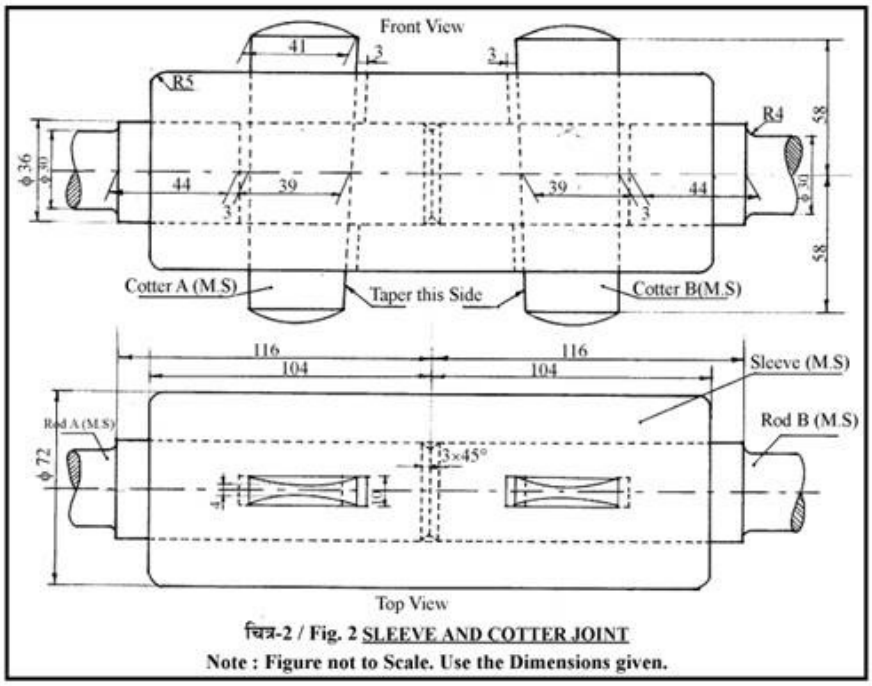
(b) Side view looking from left.

(ii) Cotter-A :

(a) Front view

(b) Top view

Print the title of both and the scale used. Draw the projection symbol. Give 6 important dimensions.



चित्र-2 / Fig. 2 SLEEVE AND COTTER JOINT

Note : Figure not to Scale. Use the Dimensions given.

Ans. FLANGED PIPE JOINT (Assembly)

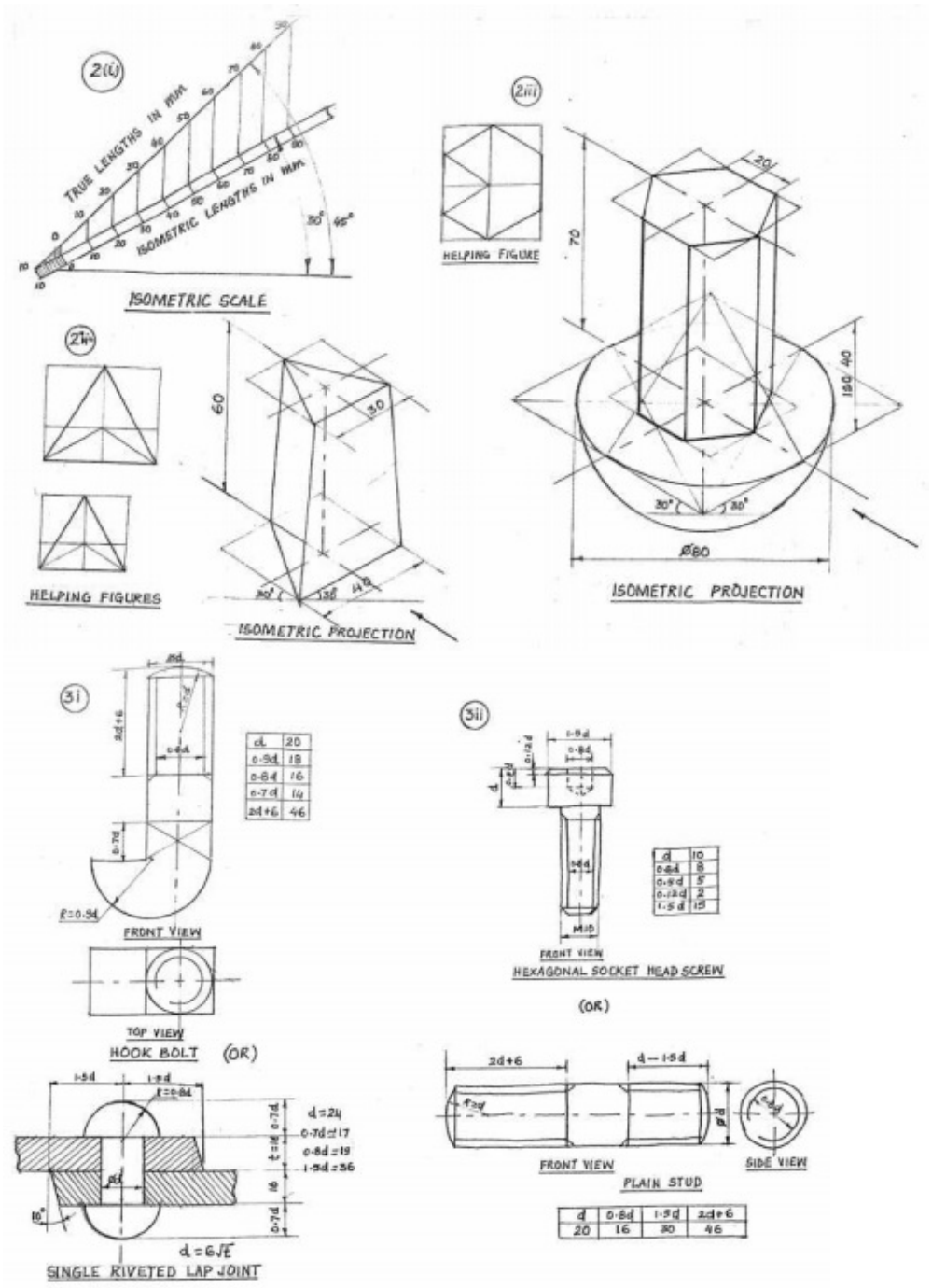
(i) FRONT VIEW (Lower Half in Section):

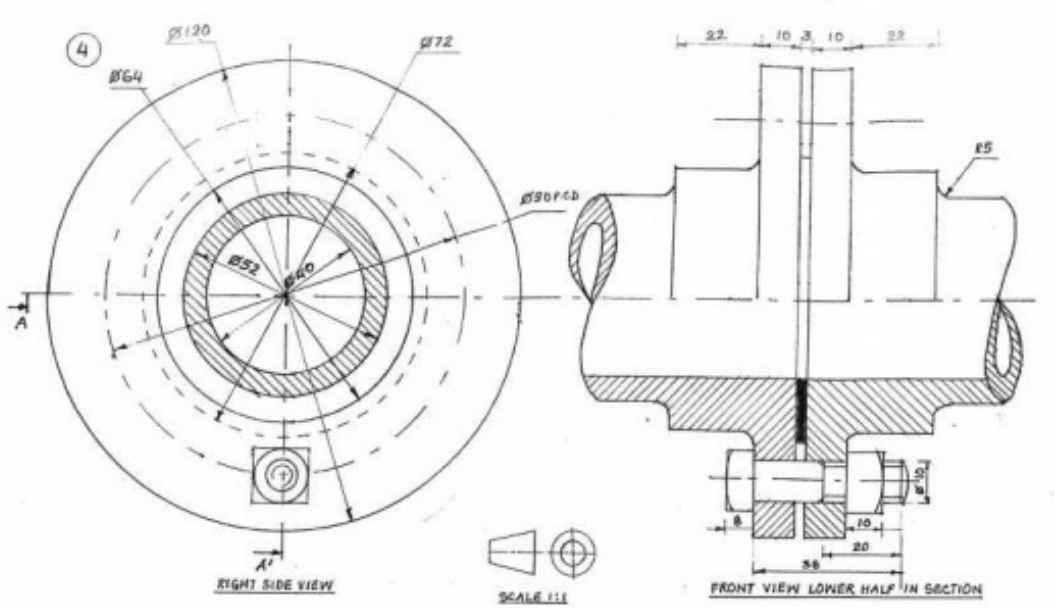
(a) Drawing both flanges and pipes in lower half portion, including fillets of R5 and conventional broken ends of pipes with hole of ø10 on a P.C.D. of ø90.
(b) Drawing both flanges and pipes in upper half portion (without section), including fillets of R5 and conventional broken ends of pipes with centre line of hole of ø10 on a P.C.D. of ø90.
(c) Hatching in lower half portion of flanges.
(d) Drawing bolt and nut of ø 10 correctly (in sectioned half at least).
(e) Indicating gasket in the upper half and lower half, and shading or cross-hatching in the lower half.
(ii) SIDE VIEW (Viewed from right side):
(a) Drawing 5 circles and pitch circle for bolts.
(b) Drawing hatching lines to indicate pipe thickness.
(c) Drawing square, chamfer circle, ø10 circle (thick) and conventional thread circle on P.C.D. (corresponding to Front View at least).
(d) Drawing cutting plane.
DETAILS:
Printing title (1), scale used (1), drawing projection symbol (1) and six dimensions (3).
[OR]
SLEEVE AND COTTER JOINT (Dis-assembly)
(A) SLEEVE
(i) FRONT VIEW (Upper Half in Section):
(a) Drawing upper half in section, including cotter holes (4), curves of R5 (1) and hatching lines (1).
(b) Drawing lower half with curves of R5.
(ii) SIDE VIEW (Viewed from right side):
(a) Circle of ø72 (2) and circle of ø36 (1 ½)
(b) Hidden lines for cotter holes.
(c) Cutting plane.
(B) COTTER A
(i) FRONT VIEW (Full in Section):
(a) Boundary of cotter with taper.
(b) Arcs.
(ii) TOP VIEW
(a) Boundary with vertical hidden line.

(b) Arcs.

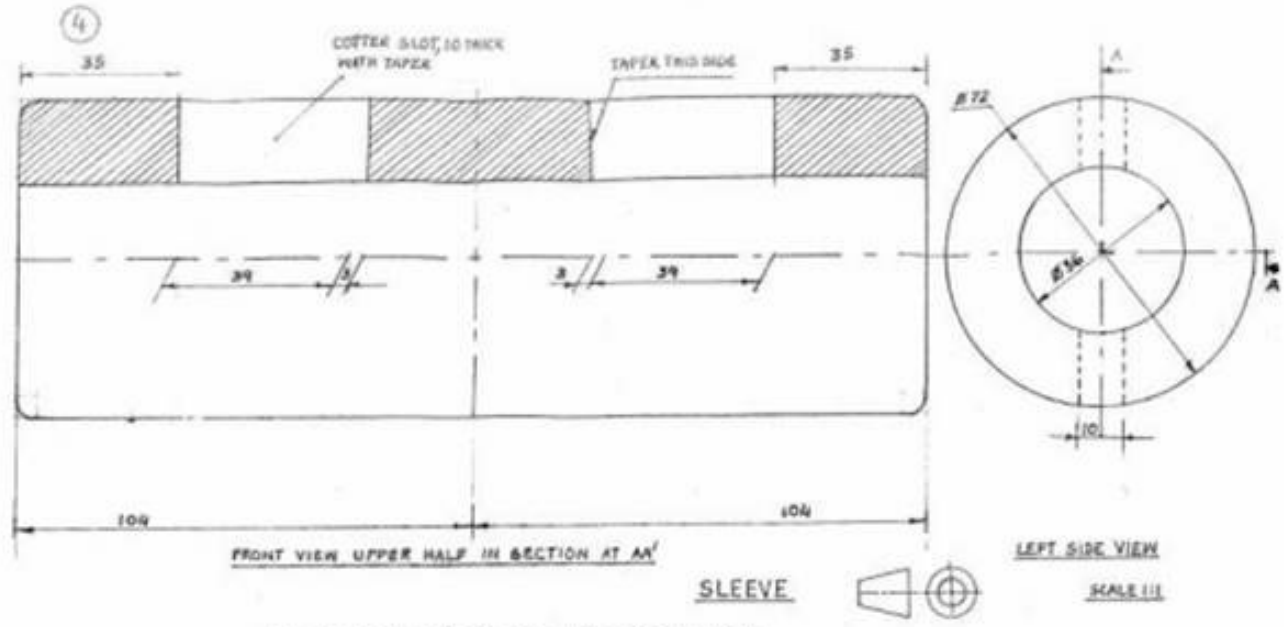
DETAILS:

Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3).





ASSEMBLY OF FLANGED PIPE JOINT



DIS ASSEMBLY OF SLEEVE AND COTTER JOINT