

Question Paper 2010 Outside Delhi set 1
CBSE Class 12 ENGINEERING DRAWING

Note:

- Attempt all the questions.
 - Use both sides of the drawing sheet, if necessary.
 - All dimensions are in millimeters.
 - Missing and mismatching dimensions, if any, may be suitably assumed.
 - Follow the SP : 46-1988 codes (with First Angle method of projection).
 - In no view of questions 1 and in no sectioned view of question 3, are hidden edges / lines required.
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1. (a) Construct an isometric scale 80 mm long. [4]

(b) Construct the isometric projection, to isometric scale, of a hexagonal pyramid (base edge = 30 mm and height = 80 mm) keeping it in the inverted position. The axis is perpendicular to H.P. One base edge is perpendicular to V.P.

Draw the axis and indicate the direction of viewing. Give all dimensions. [7]

(c) A cylinder (diameter = 50 mm and height = 70 mm) is placed, centrally, with its circular end on the pentagonal face of a pentagonal prism (base edge = 40 mm and height = 30 mm). The common axis is perpendicular to H.P. The base of the prism is on H.P. and one of its base edges is parallel to V.P. and away from it.

Draw the isometric projection of the solids, placed together, to isometric scale. Draw the common axis and indicate the direction of viewing. Give all dimensions. [14]

Ans. (a) ISOMETRIC SCALE

(i) Marking of divisions of 10 mm, 1 mm on true scale and marking angles of 30° & 45° .

(ii) Projections from scale 1:1 to get points on Isometric scale.

(iii) Construction of Isometric scale with main divisions of 10 mm each.

(iv) Division of the first part into 10 sub-divisions.

(v) Printing “Scale 1:1” and ‘Isometric Scale’

(b) ISOMETRIC PROJECTION OF AN INVERTED HEXAGONAL PYRAMID

(i) Helping view (with isometric scale or scale 1:1) of hexagon with a side, perpendicular to V.P.

(ii) Drawing isometric hexagon on top

(iii) Drawing slant edges

(iv) Marking the axis and direction of viewing

(v) Two dimensions, including that axis through in-centres

CYLINDER:-

(i) Correct central placement and drawing common vertical axis. (ii) Drawing ellipses for top and base. (iii) Drawing tangents to ellipses

(iv) Dimensioning diameter and axis through in-centres (v) Neatness and line work

(c) CYLINDER, PLACED, CENTRALLY, ON PENTAGONAL PRISM:

PENTAGONAL PRISM:

(i) Helping view (with isometric scale or scale 1:1) of pentagon with a side, parallel to V.P. and away from it.

(ii) Drawing isometric pentagons at the top and bottom

(iii) Drawing face edges parallel to axis.

(iv) Dimensioning (base side and height)

2. (a) Draw to scale 1:1 the standard profile of a B.S.W. thread, taking enlarged pitch = 50 mm. Give all standard dimensions. [9]

OR

Draw the full sectional front view and top view of a single riveted lap joint.

Take plate thickness = 9 mm. Give all standard dimensions. Use scale 1 : 1.

(b) Sketch free-hand the front view and top view of a 90° flat counter sunk head screw of size M 20, keeping the axis vertical. Give all standard dimensions. [6]

OR

Sketch free-hand the front view, top view and side view of a Woodruff key for a shaft of 60 mm diameter. Give all standard dimensions.

Ans. (a) B.S.W . THREAD PROFILE

(i) Distances, equal to pitch, marked correctly and angles 55° drawn

correctly. (ii) Curves for threads (minimum 2 curves at the top and bottom) (iii) Side edges (

flanks) , tangential to the curves (iv) Dimensioning (v) Neatness and line work

OR

SINGLE RIVETED LAP JOINT

SECTIONAL FRONT VIEW

(i) Plates with hatching line (ii) Rivet with both head

TOP VIEW

(i) Two plates correctly positioned.

(ii) Rivet heads (minimum 2) with correct pitch length and their axes along with Cutting plane line

(iii) Dimensioning, neatness and line work.

(b) 90° FLAT COUNTER SUNK HEAD SCREEN

(i) Sketching front view with its axis, perpendicular to HP

(ii) Sketching top view.

(iii) Dimensioning

OR

WOOD RUFF KEY

(i) In front view, keeping horizontal edge at $0.25 t$ below the centre

(ii) Drawing the horizontal edge and curve with a radius of $R = 2t$

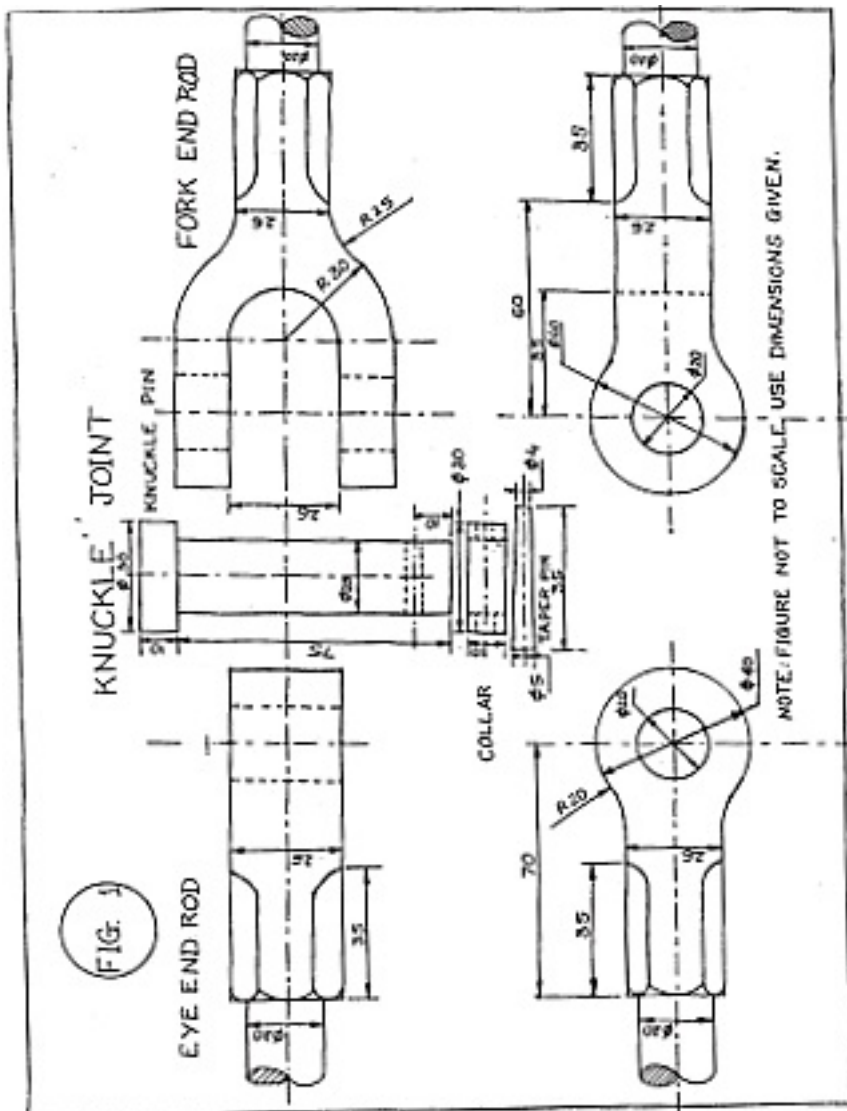
(iii) Drawing side view

(iv) Drawing top view

(v) Dimensioning

3. Figure 1, shows the details of a knuckle joint. Assemble the parts correctly and then draw, to scale 1 : 1, the front view, lower half in section. [24]

Print title and scale used. Give 8 important dimensions. [6]



OR

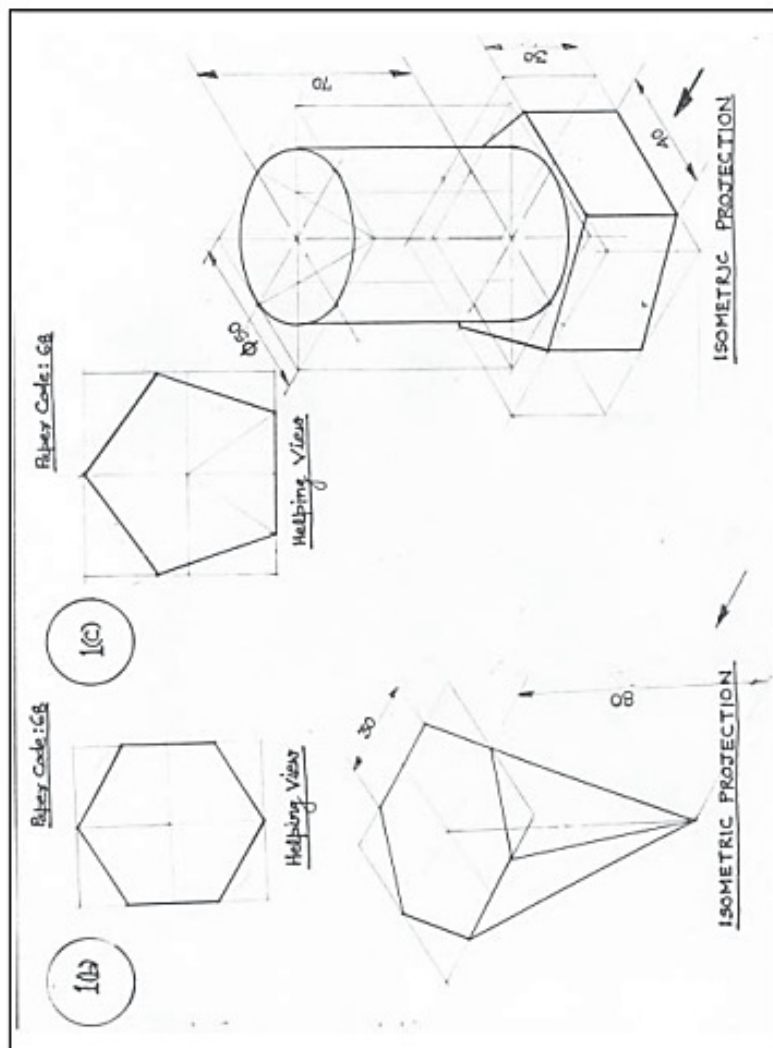
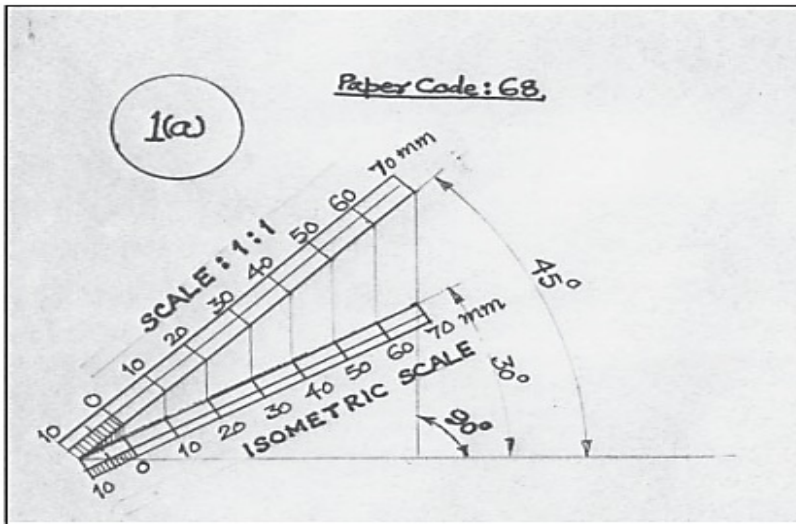
Figure 2, shows the assembly of an open bearing. Disassemble the base and the bush and draw the following views to scale 1 : 1. Keep the same positions of the base and the bush with respect to H.P. and V.P.

- (a) Front view of the base, showing right half in section, and its top View. [16]
 - (b) Front view of the bush and full sectional side view, as seen from the left side. [8]
- Print titles of both and scale used. Draw the projection symbol. Give 8 important dimensions. [6]

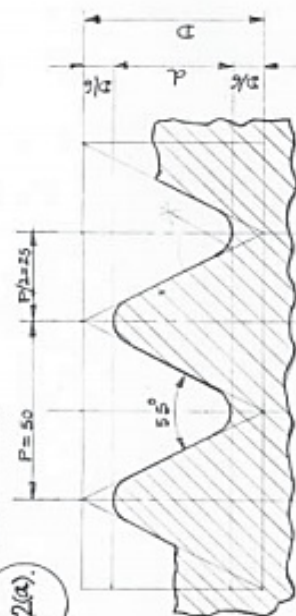
- (i) Drawing entire boundary (ii) Horizontal dark line for R20, axis and hatching lines
- (iii) Neatness and line work

DETAILS (6)

Titles of both (2), scale used (1), projection symbol (1) and eight dimensions (2)



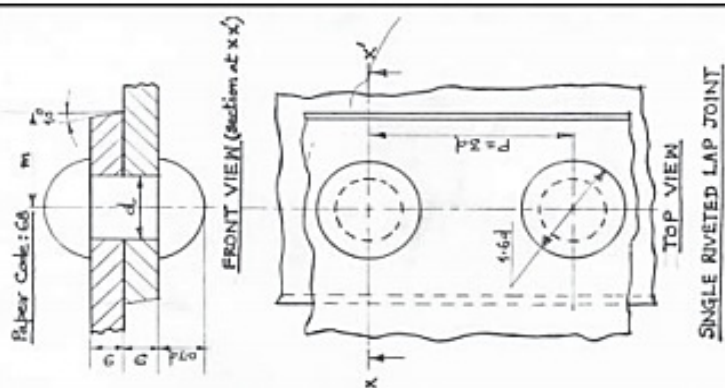
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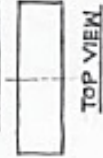
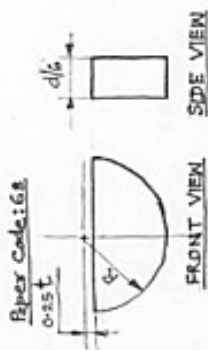
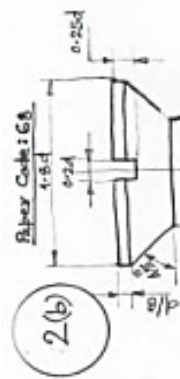


B.S.W. THREAD

ϕ	d
0.94P	0.64P

d	18
ϕ	12.6
P	23.8
m	27

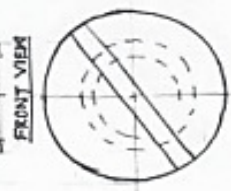




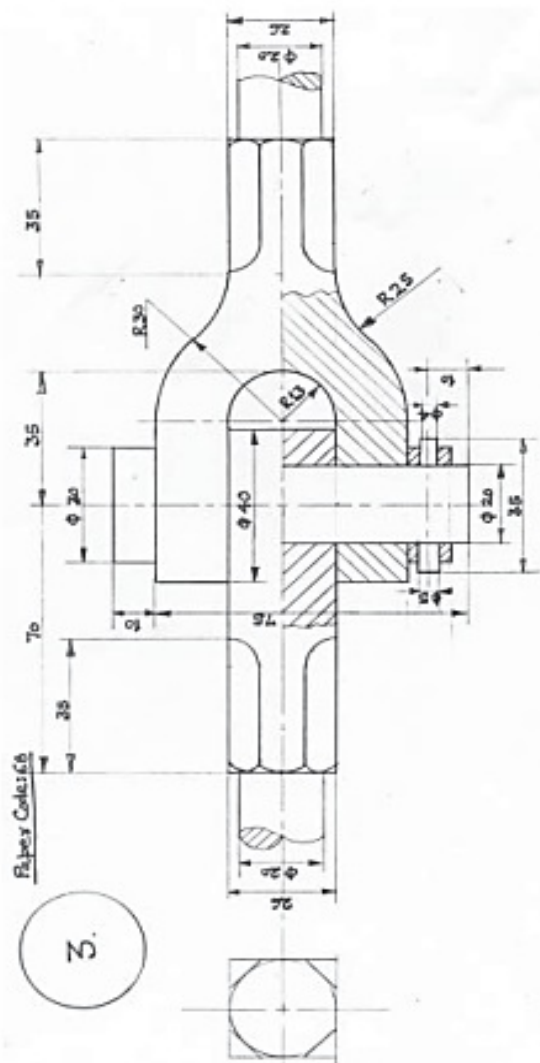
WOODRUFF KEY

d	t = $\frac{d}{6}$	0.25t	R = 2b
6.0	1.0	2.5	2.0

d	2.0
0.2d	4
0.25d	5
d/8	2.5
0.85d	17
1.8d	36



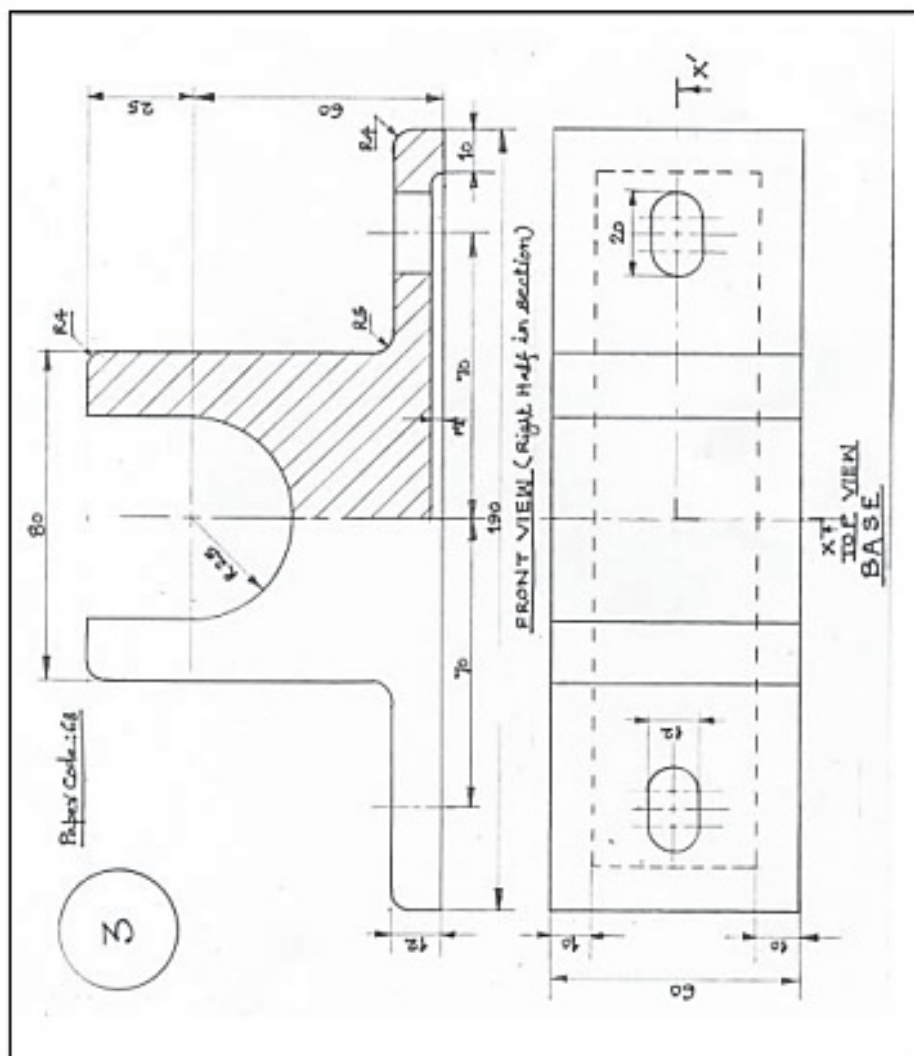
90° FLAT COUNTER SUNK HEAD SCREW



FRONT VIEW (Lower Half in section)

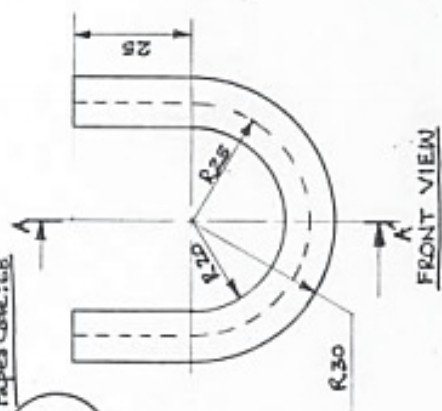
NUCKLE JOINT

SCALE: 1:1

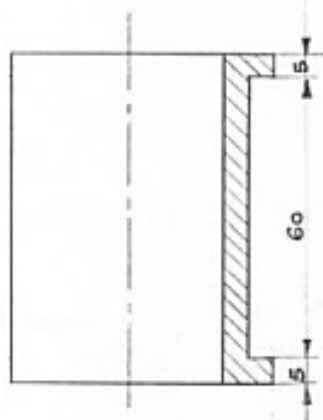


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SIDE VIEW (Section at A-A')



BUSH

OPEN BEARING



SCALE: 1:1