MARKING SCHEME

Senior School Certificate Examination – 2017

Subject : ENGINEERING GRAPHICS
Sub Code : 046
Paper Code : 68/1

ALL QUESTIONS ARE TO BE ANSWERED CORRECTLY AND ACCURATELY.

General Note:

a) Marks are to be awarded in proportion to the work done.
b) Mistakes in dimensioning up to ± 1.0 mm may be ignored.
c) In dimensioning, arrow-heads of various types, as per SP: 46-2003 codes are acceptable. However, where space is too small for an arrowhead, oblique stroke or dot may be employed.
d) In question no. 2 and in sectioned view of question no. 4, if hidden edges / lines are drawn, no marks should be deducted.
e) Other standard methods of drawing / proportions for features like nuts, heads of bolts, screws etc. employed by examinees, may also be accepted.

VALUE POINTS

		Distribution of Marks
Q 1.	**MULTIPLE CHOICE QUESTIONS**	**5**
(i)	(d) *or* Thin Continuous Lines.	*1*
(ii)	(a) *or* External square threads.	*1*
(iii)	(a) *or* To facilitate the withdrawal of the key without disturbing the setting of the Hub.	*1*
(iv)	(b) *or* To support the moving shaft.	*1*
(v)	(c) *or* Key.	*1*
Q 2. (i)	**ISOMETRIC SCALE**	**4**
(i)	Marking of divisions of 10 mm, including division of first part of 1 mm on true length.	*1*
(ii)	Projections from scale 1:1 to get points on isometric scale, construction of isometric scale.	*2*
(iii)	Printing 'True Length/Scale 1:1', 'Isometric Length/Isometric Scale' and marking angles of 30^{o} & 45^{o}.	*1*

(ii) ISOMETRIC PROJECTION OF A FRUSTUM OF A TRIANGULAR PYRAMID **7**

(i) Drawing helping figure of both triangles. *1½*

(ii) Drawing isometric triangle, on top and at the base. *2*

(iii) Drawing three slant edges. *1½*

(iv) Marking the vertical axis (½) and direction of viewing (½). *1*

(v) Dimensions. *1*

NOTE: *For incorrect position, 1 mark should be deducted*.

(iii) ISOMETRIC PROJECTION OF A HEXAGONAL PRISM PLACED, CENTRALLY, ON A HEMISPHERE **13**

HEMISPHERE **6**

(i) Drawing isometric ellipse (2½) along with centre lines (½). *3*

(ii) Drawing semicircular portion of hemisphere. *1½*

(iii) Marking the vertical axis. *½*

(iv) Dimensions. *1*

HEXAGONAL PRISM **7**

(i) Drawing helping figure. *1*

(ii) Drawing both isometric hexagons. *2*

(iii) Drawing vertical edges. *2*

(iv) Marking the vertical axis (½) and direction of viewing (½). *1*

(v) Dimensions. *1*

NOTE: *For incorrectly placed solids, deductions, as proposed in (ii) above, should be used.*

Q 3. (i) HOOK BOLT **8**

FRONT VIEW:

(i) Threaded and unthreaded portions of cylindrical shank. *2*

(ii) Head of bolt with square neck. *2*

TOP VIEW:

(i) Rectangle with one vertical line. *1*

(ii) Two circles as per convention. *1*

Standard dimensions. *2*

[OR]

SINGLE RIVETED LAP JOINT **8**

(i) Drawing both the plates, including 10^0 taper at ends. 3
(ii) Drawing both rivet heads (Any type). 2
(iii) Drawing hatching lines. 1
(iv) Standard dimensions. 2

NOTE: 2 *marks should be deducted, in all, if sketched freehand, instead of drawing to scale 1:1.*

(ii) HEXAGONAL SOCKET HEAD SCREW **5**

Front view with its axis perpendicular to H.P.

(i) Drawing the head. *2*
(ii) Drawing the shank with threaded and unthreaded portions. *2*
(iii) Standard dimensions. *1*

[OR]

PLAIN STUD **5**

(i) Front view with its axis parallel to both H.P. and V.P. *$2^1/_2$*
(ii) Side view. *$1^1/_2$*
(iii) Standard dimensions. *1*

NOTE: 1 *mark should be deducted, if these components are drawn with instruments, instead of being sketched freehand.*

Q 4. FLANGED PIPE JOINT (Assembly)

(i) FRONT VIEW (Lower Half in Section) : **14**

(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. *$3^1/_2$*

(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. *$3^1/_2$*

(c) Hatching in lower half portion of flanges. *2*

(d) Drawing bolt and nut of ø 10 correctly (in sectioned half at least). *3*

(e) Indicating gasket in the upper half and lower half, and shading or cross-hatching in the lower half. *2*

(ii) SIDE VIEW (Viewed from right side): **8**

(a) Drawing 5 circles and pitch circle for bolts. *3*

(b) Drawing hatching lines to indicate pipe thickness. *2*

(c) Drawing square, chamfer circle, ø10 circle (thick) and conventional thread circle on P.C.D. (corresponding to Front View at least). *$2^1/_2$*

(d) Drawing cutting plane. *$^1/_2$*

DETAILS : **6**

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) : **8**

(a) Drawing upper half in section, including cotter holes (4), curves of R5 (1) and hatching lines (1). *6*

(b) Drawing lower half with curves of R5. *2*

(ii) SIDE VIEW (Viewed from right side) : **7**

(a) Circle of ø72 (2) and circle of ø36 ($1^1/_2$) *$3^1/_2$*

(b) Hidden lines for cotter holes. *3*

(c) Cutting plane. *$^1/_2$*

(B) COTTER A

(i) FRONT VIEW (Full in Section): **4**

(a) Boundary of cotter with taper. *2*

(b) Arcs. *2*

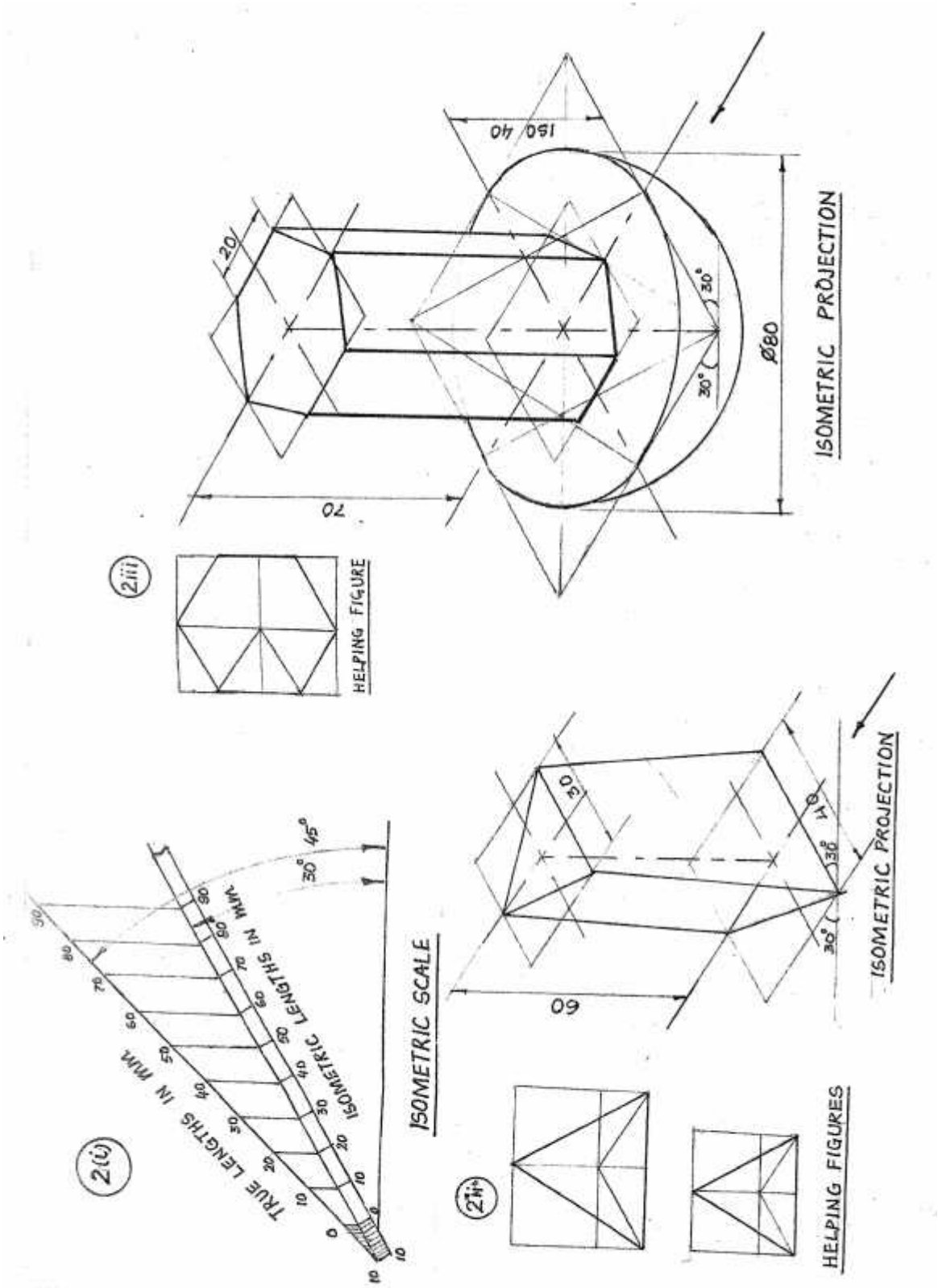
(ii) TOP VIEW **3**

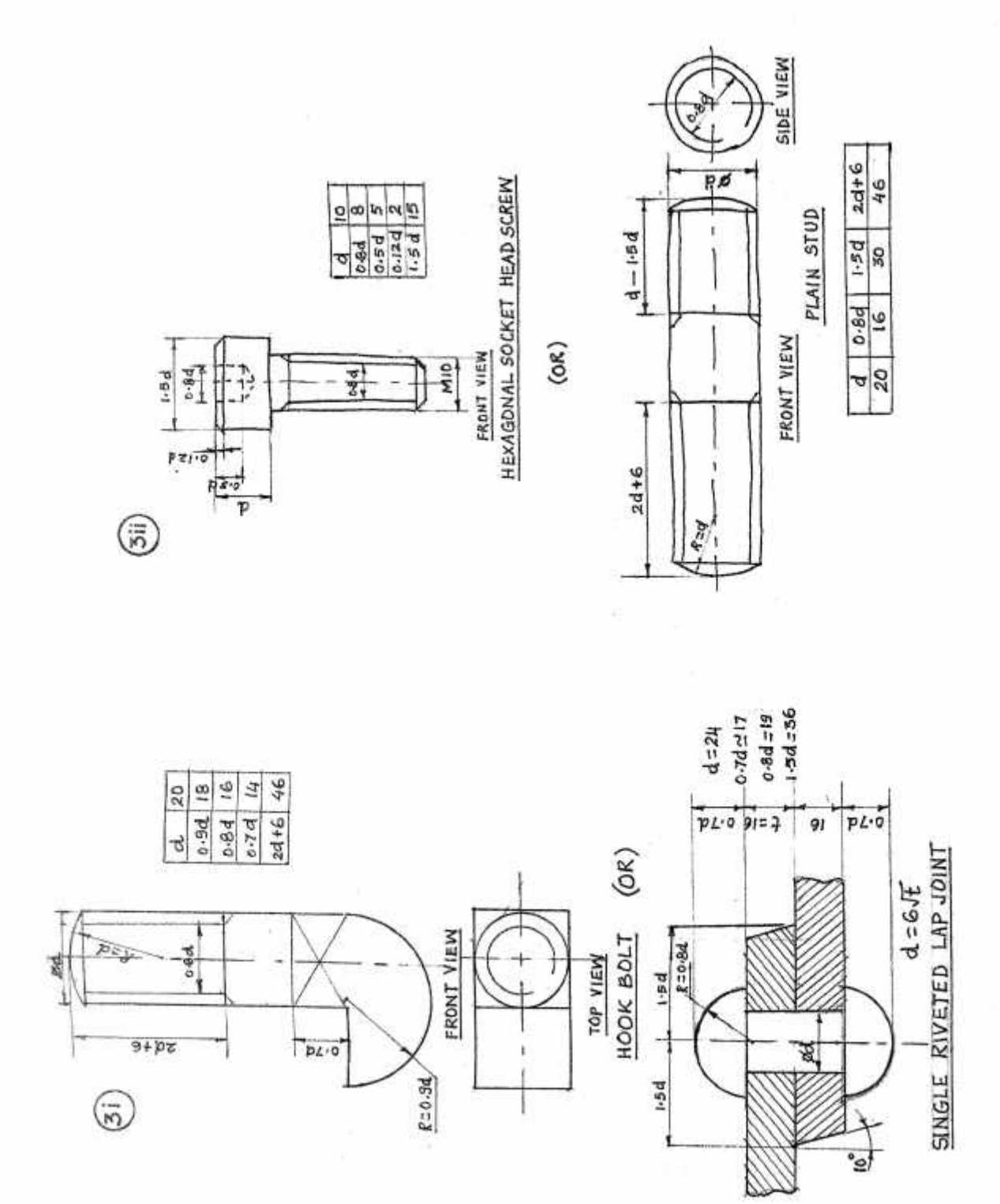
(a) Boundary with vertical hidden line. *2*

(b) Arcs. *1*

DETAILS : **6**

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

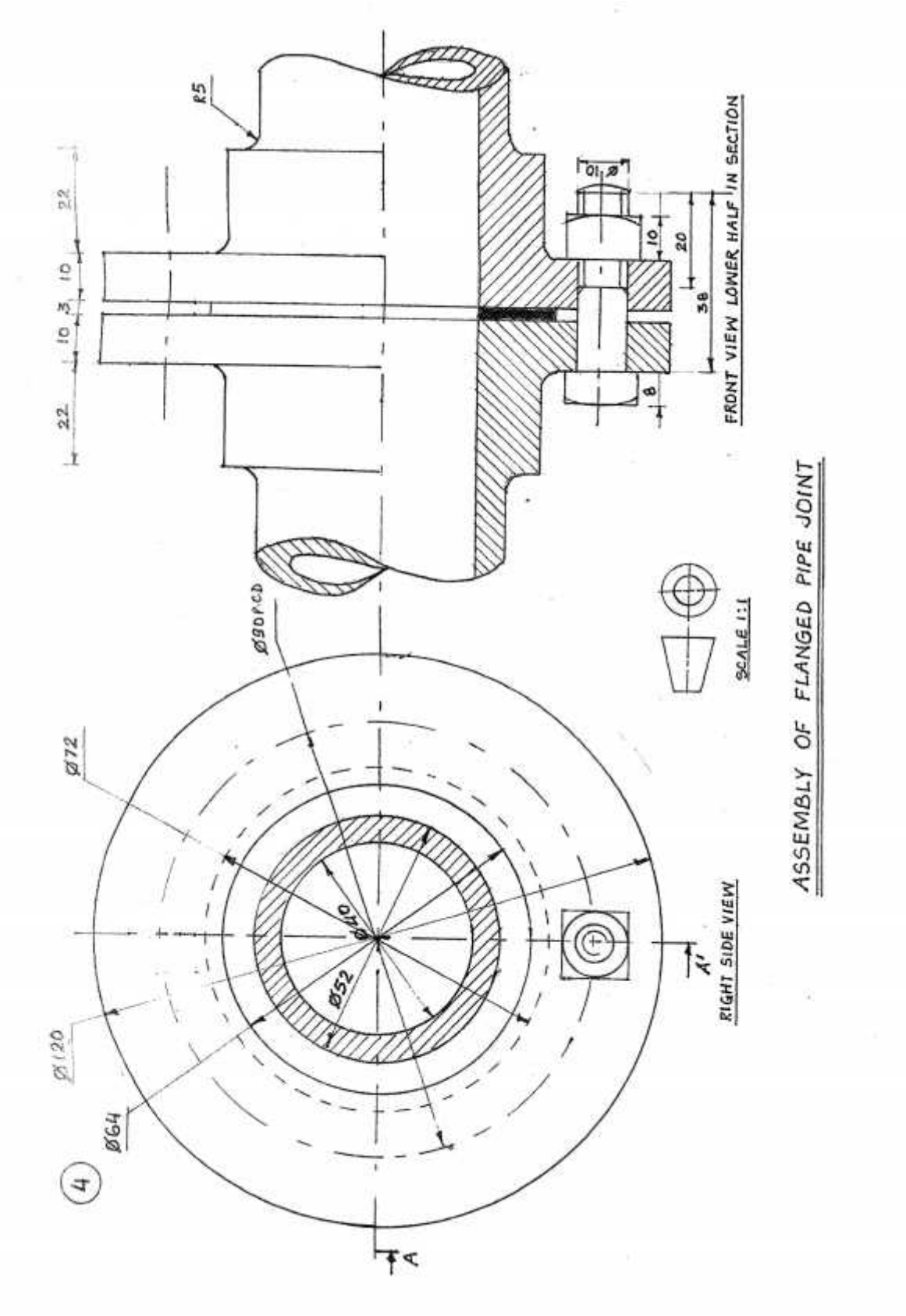

2(i)
TRUE LENGTHS IN MM
ISOMETRIC LENGTHS IN MM
ISOMETRIC SCALE
30°
45°
2(ii)
HELPING FIGURES
ISOMETRIC PROJECTION
60
30°
30°
2(iii)
HELPING FIGURE
ISOMETRIC PROJECTION
70
Ø80
30°
30°
20
150/40

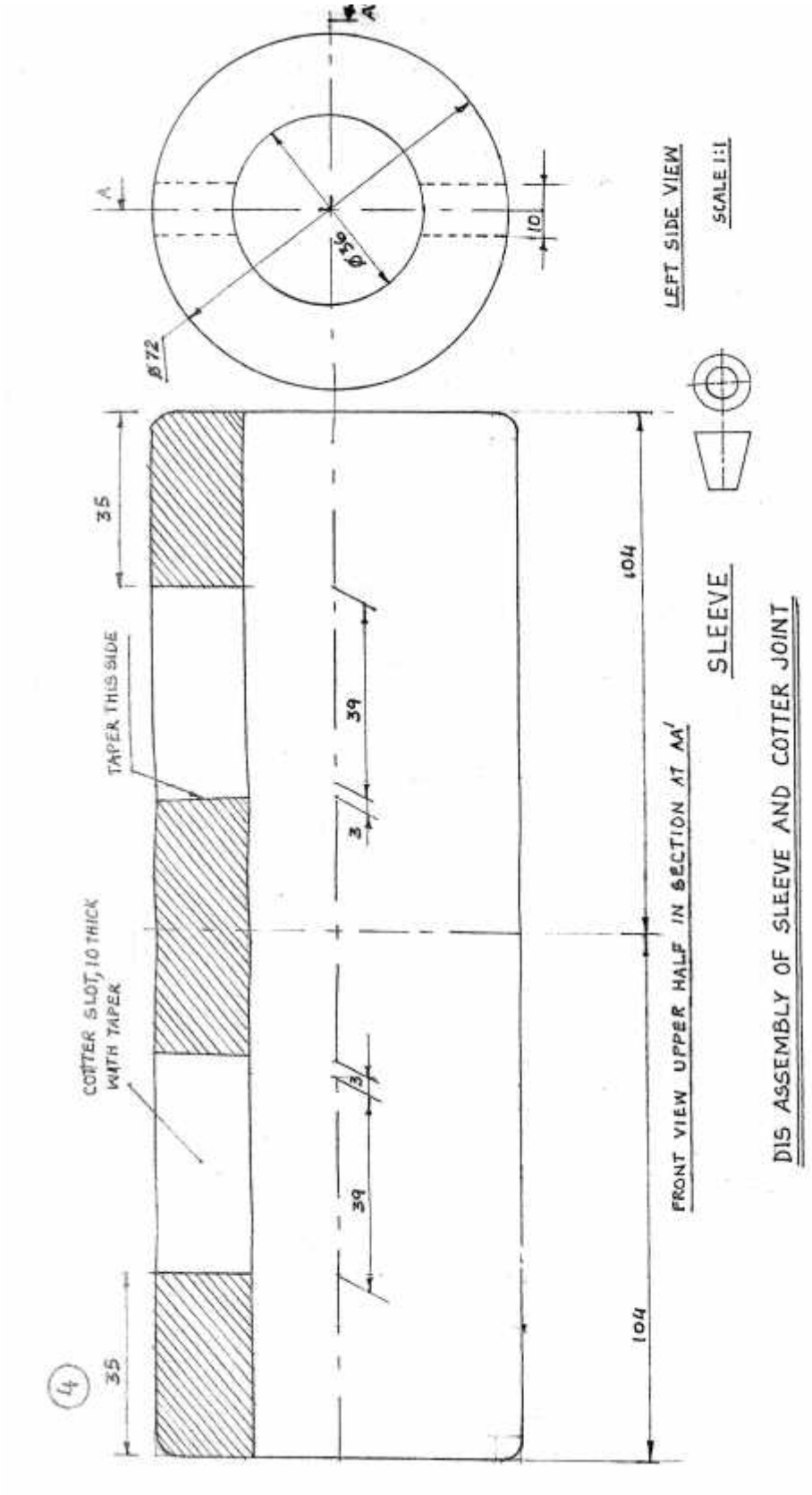


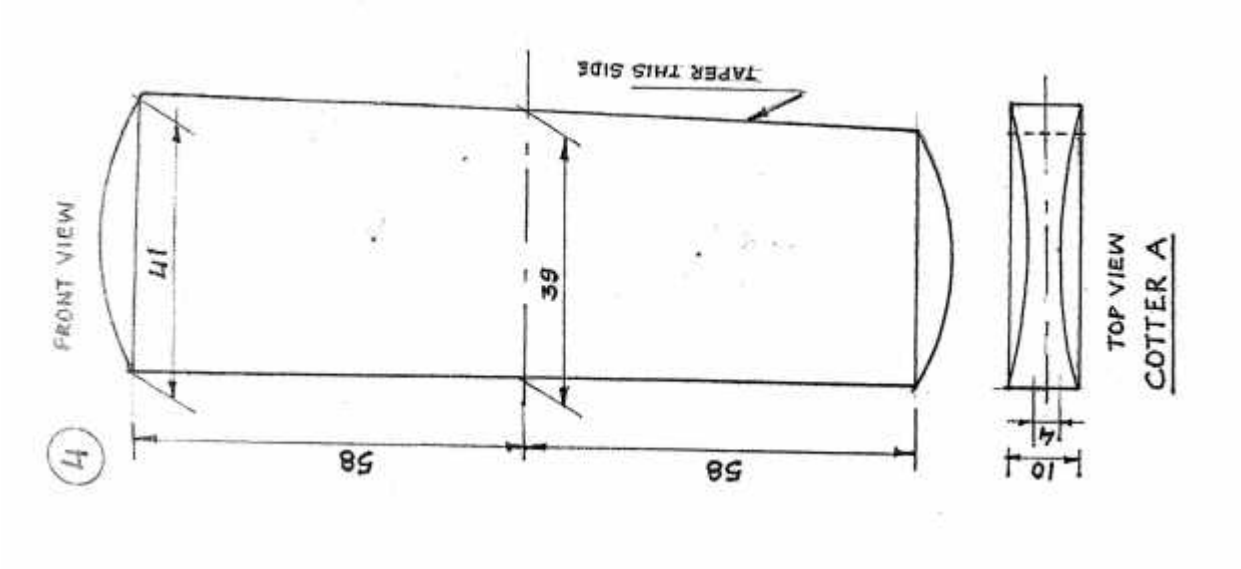
d	20
0.9d	18
0.8d	16
0.7d	14
2d+6	46

d	10
0.6d	8
0.5d	5
0.12d	2
1.5d	15

d	0.8d	1.5d	2d+6
20	16	30	46


ASSEMBLY OF FLANGED PIPE JOINT
FRONT VIEW LOWER HALF IN SECTION
RIGHT SIDE VIEW
SCALE 1:1
R5
22
10
3
10
22
10
20
38
8
Ø90 P.C.D
Ø72
Ø40
Ø52
Ø120
Ø64
A
A'
4


A
A
10
ϕ36
ϕ72
LEFT SIDE VIEW
SCALE 1:1
35
TAPER THIS SIDE
39
3
104
SLEEVE
COTTER SLOT, 10 THICK
WITH TAPER
3
39
35
104
FRONT VIEW UPPER HALF IN SECTION AT AA'
4
DIS ASSEMBLY OF SLEEVE AND COTTER JOINT


TAPER THIS SIDE
FRONT VIEW
41
39
58
58
TOP VIEW
COTTER A
4
10
4