MARKING SCHEME

Senior School Certificate Examination – 2015

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

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)	(c) *or* Hatching/section linings.	*1*
(ii)	(b) *or* Metal end.	*1*
(iii)	(b) *or* Single riveted lap joint.	*1*
(iv)	(a) *or* Journal.	*1*
(v)	(d) *or* Ensure safety.	*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 HEXAGONAL PYRAMID **7**

(i) Drawing helping figure of both hexagons. *1½*
(ii) Drawing isometric hexagon, on top and at the base. *2*
(iii) Drawing four slant edges. *1½*
(iv) Marking the vertical axis, direction of viewing. *1*
(v) Dimensions. *1*

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

(iii) ISOMETRIC PROJECTION OF A CONE PLACED, CENTRALLY, ON A TRIANGULAR PRISM **13**

TRIANGULAR PRISM **7**

(i) Drawing helping figure. *1*
(ii) Drawing both isometric triangles. *2½*
(iii) Drawing horizontal edges. *2*
(iv) Marking the horizontal axis. *½*
(v) Dimensions. *1*

CONE **6**

(i) Drawing isometric ellipse along with centre lines. *2*
(ii) Drawing both generators. *2*
(iii) Marking the vertical axis (½) and direction of viewing (½). *1*
(iv) Dimensions. *1*

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

Q 3. (i) B.S.W. THREAD PROFILE **8**

(i) Horizontal distances (equal to half of pitch), vertical distances (D=0.96P, D/6) marked correctly. *2*
(ii) Drawing roots and crests of threads (minimum two) and flanks, drawn correctly. *3*
(iii) Drawing hatching lines and conventional break. *1*
(iv) Standard dimensions. *2*

[OR]

HOOK BOLT **8**

FRONT VIEW:

(i) Threaded and unthreaded portions of cylindrical shank with square neck. *3*

(ii) Head of bolt. *1*

SIDE VIEW:

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

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

Standard dimensions. *2*

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

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

Front view with its axis perpendicular to H.P.

(i) Drawing the head. *2*

(ii) Drawing the shank. *2*

(iii) Standard dimensions. *1*

[OR]

WOODRUFF KEY **5**

(i) Front view. *2*

(ii) Top view. *1*

(iii) Side View. *1*

(iv) Standard dimensions. *1*

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

Q 4. SLEEVE AND COTTER JOINT (Assembly)

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

(a) Sleeve in upper half, clearances, hatching lines. *3*

(b) Rods with broken section around cotter in upper half, clearances, chamfered ends and broken ends as per convention. *5*

(c) Cotters in upper half. *3*

(d) Sleeve, rods and cotters in lower half. *3*

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

(a) Four circles. *4*

(b) Cotter. $2^1/_2$

(c) Hatching as per convention. *1*

(d) Cutting plane. $^1/_2$

DETAILS : **6**

Printing title(1), scale used(1), drawing projection symbol(1) and six dimensions(3).

[OR]

FLANGE PIPE JOINT (Dis-assembly)

1) FLANGE B:

(i) FRONT VIEW (Upper Half in Section) : **8**

(a) Flange in upper half(2), hole for bolt(1), broken end as per convention(1), hatching(1). *5*

(b) Flange in lower half. *3*

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

(a) Four circles(4), one pitch circle diameter($^1/_2$). $4^1/_2$

(b) Drawing four holes for bolt. *2*

(c) Hatching as per convention. *1*

(d) Cutting plane. $^1/_2$

2) GASKET

(i) FRONT VIEW (Full in Section): **3**

(a) Boundry with two horizontal lines. *2*

(b) Shading for rubber. *1*

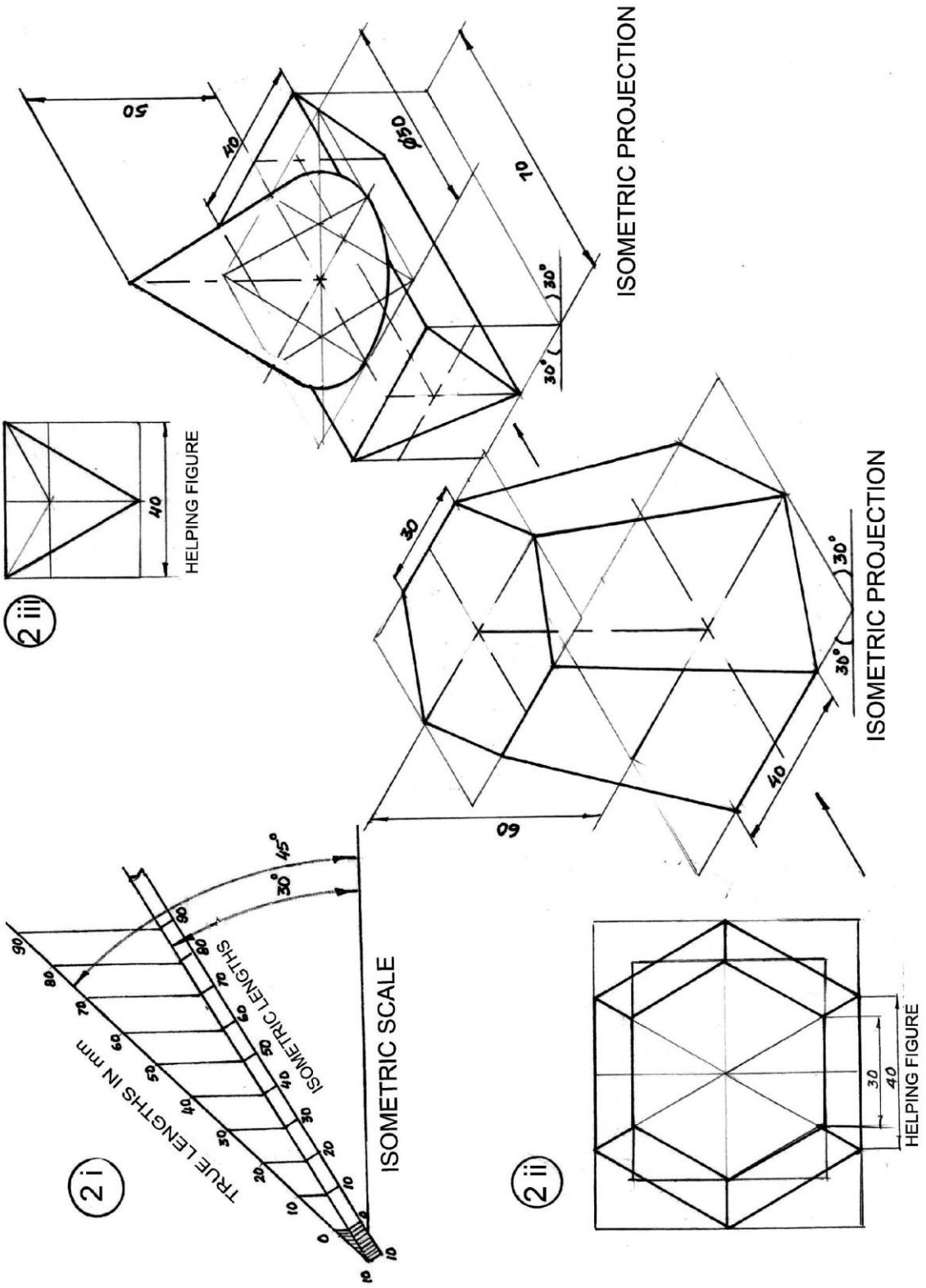
(ii) SIDE VIEW (Viewed from left side) : **3**

(a) Two circles. $2^1/_2$

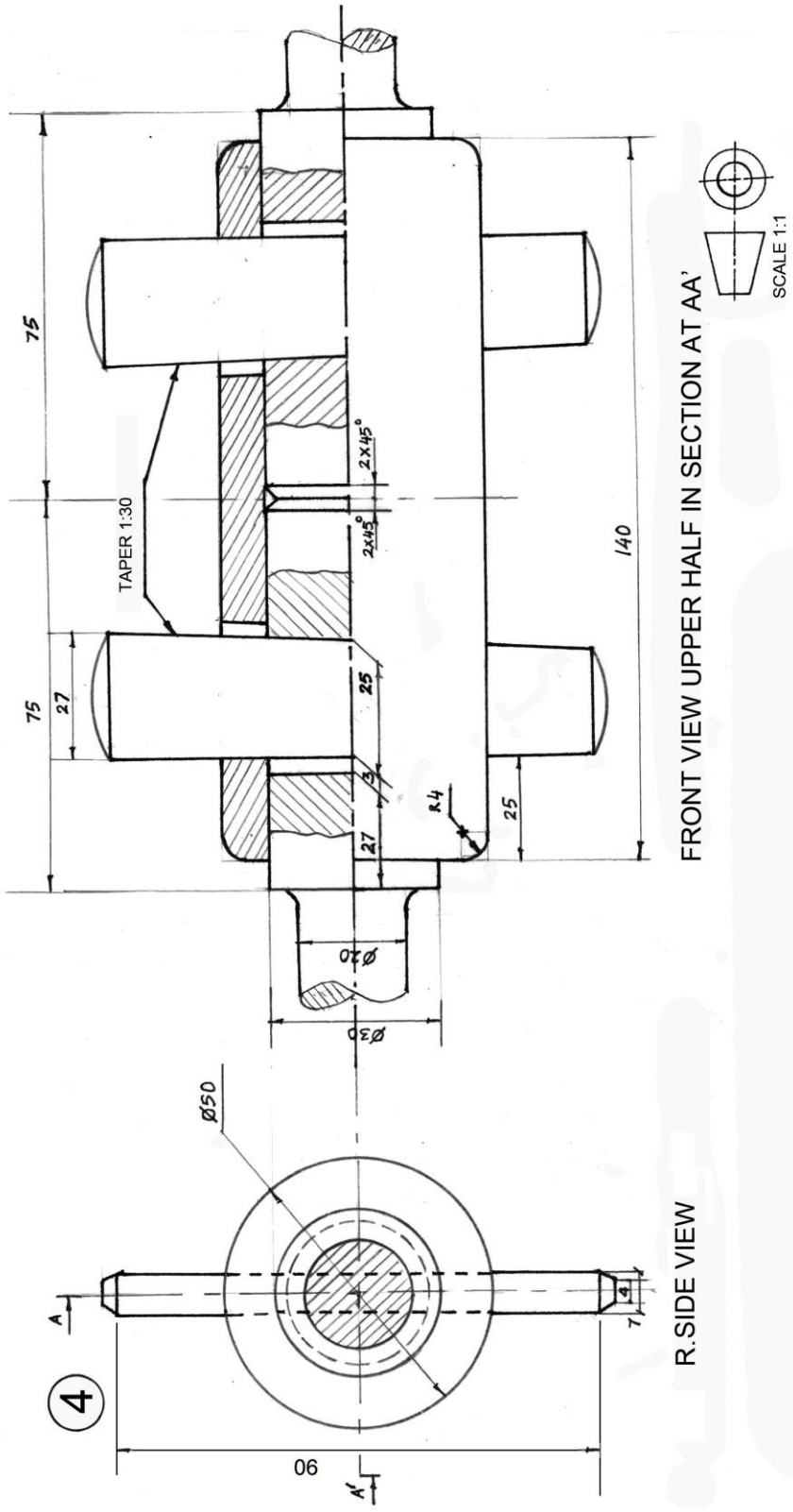
(b) Cutting plane. $^1/_2$

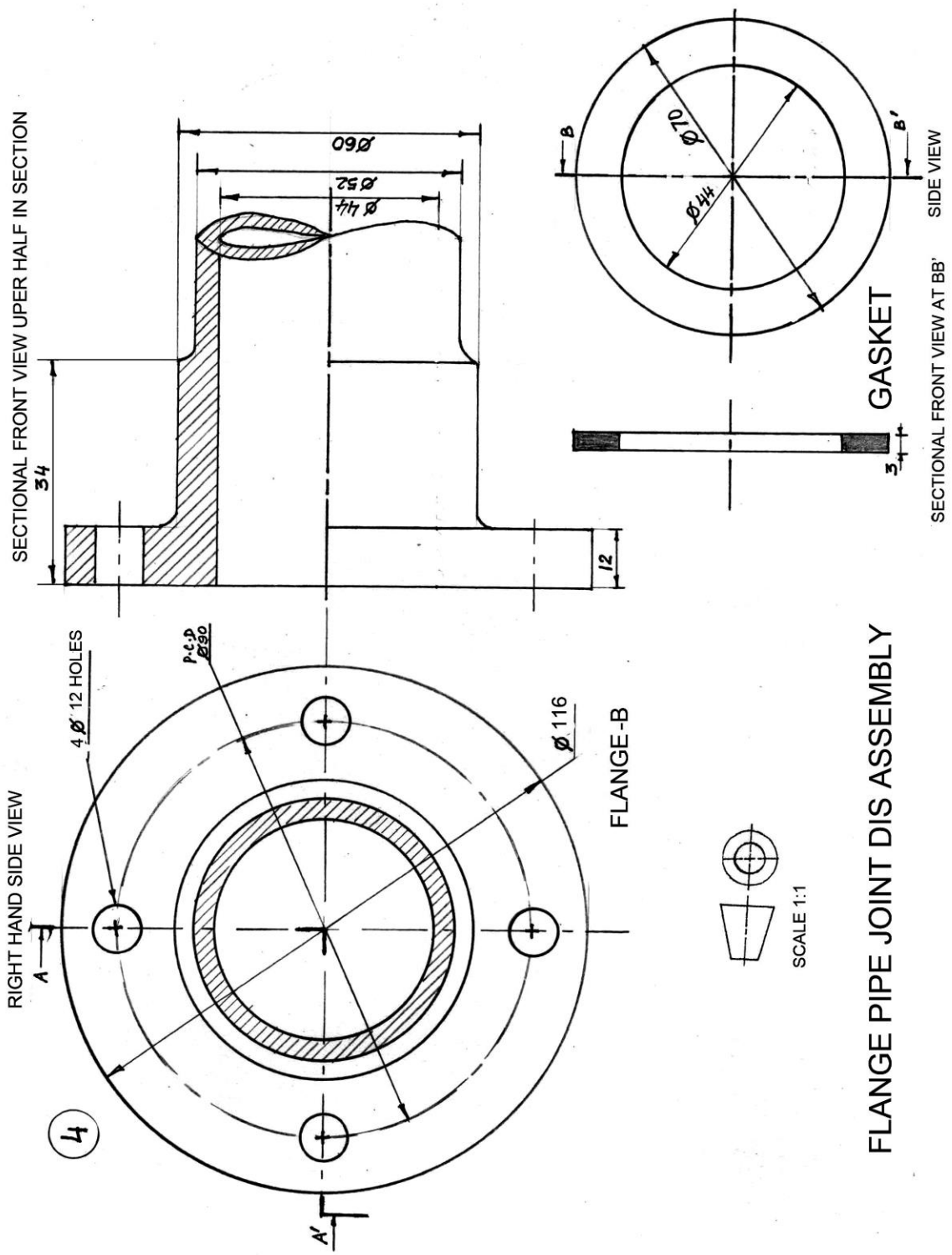
DETAILS : **6**

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


ISOMETRIC PROJECTION
ISOMETRIC PROJECTION
HELPING FIGURE
HELPING FIGURE
ISOMETRIC SCALE
TRUE LENGTHS IN mm
ISOMETRIC LENGTHS
2 i
2 ii
2 iii
30°
45°

3 i
P
0.5P
55°
D=0.96P
d=0.64P
B.S.W.THREAD
P | D | d | D/6
40 | 38 | 26 | 06
OR
3 ii
FRONT VIEW
0.8d
0.12d
0.5d
p
0.8d
M2D
SOCKET HEAD SCREW
d | 20
0.8d | 16
1.5d | 30
0.12d | 2.4
0.5d | 10
OR
HOOK BOLT
R=0.9d
0.7d
2d+6
p
p/2
R=d
p/2
FRONT VIEW
SIDE VIEW
d | 0.7d | 0.9d | 2d+6
20 | 14 | 18 | 46
t
0.25t
R=2t
FRONT VIEW
SIDE VIEW
TOP VIEW
WOODRUFF KEY
d | 60
t=d/6 | 10
R=2t | 20
0.25t | 2.5


SLEEVE AND COTTER JOINT ASSEMBLY
FRONT VIEW UPPER HALF IN SECTION AT AA'
SCALE 1:1
R.SIDE VIEW
TAPER 1:30
2X45°
2X45°
75
75
27
25
3
R4
27
25
140
Ø50
Ø
Ø
4
7
A
A'
06


SECTIONAL FRONT VIEW UPER HALF IN SECTION
34
Ø60
Ø52
Ø44
12
RIGHT HAND SIDE VIEW
4 Ø 12 HOLES
P.C.D Ø90
Ø 116
FLANGE-B
A
A'
4
SCALE 1:1
B
B'
Ø70
Ø44
GASKET
3
SECTIONAL FRONT VIEW AT BB'
SIDE VIEW
FLANGE PIPE JOINT DIS ASSEMBLY