

**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  $\pm 1.0$  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**

		<u>Distribution</u>
		<u>of Marks</u>
<b>Q 1.</b>	<b><u>MULTIPLE CHOICE QUESTIONS</u></b>	<b>5</b>
	(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
<b>Q 2. (i)</b>	<b>ISOMETRIC SCALE</b>	<b>4</b>
	(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 $30^\circ$ & $45^\circ$ .	1

<b>(ii) ISOMETRIC PROJECTION OF A FRUSTUM OF A HEXAGONAL PYRAMID</b>	<b>7</b>
(i) Drawing helping figure of both hexagons.	1 <sup>1</sup> / <sub>2</sub>
(ii) Drawing isometric hexagon, on top and at the base.	2
(iii) Drawing four slant edges.	1 <sup>1</sup> / <sub>2</sub>
(iv) Marking the vertical axis, direction of viewing.	1
(v) Dimensions.	1

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

<b>(iii) ISOMETRIC PROJECTION OF A CONE PLACED, CENTRALLY, ON A TRIANGULAR PRISM</b>	<b>13</b>
<u>TRIANGULAR PRISM</u>	<b>7</b>
(i) Drawing helping figure.	1
(ii) Drawing both isometric triangles.	2 <sup>1</sup> / <sub>2</sub>
(iii) Drawing horizontal edges.	2
(iv) Marking the horizontal axis.	1 <sup>1</sup> / <sub>2</sub>
(v) Dimensions.	1
<u>CONE</u>	<b>6</b>
(i) Drawing isometric ellipse along with centre lines.	2
(ii) Drawing both generators.	2
(iii) Marking the vertical axis (1 <sup>1</sup> / <sub>2</sub> ) and direction of viewing (1 <sup>1</sup> / <sub>2</sub> ).	1
(iv) Dimensions.	1

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

<b>Q 3. (i) <u>B.S.W. THREAD PROFILE</u></b>	<b>8</b>
(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) <u>SIDE VIEW</u> (Viewed from right side):   | <b>8</b>                      |
| (a) Four circles.   | 4                             |
| (b) Cotter.   | 2 <sup>1</sup> / <sub>2</sub> |
| (c) Hatching as per convention.   | 1                             |
| (d) Cutting plane.  | 1 <sup>1</sup> / <sub>2</sub> |

- DETAILS : **6**
- Printing title(1), scale used(1), drawing projection symbol(1) and six dimensions(3).

[OR]

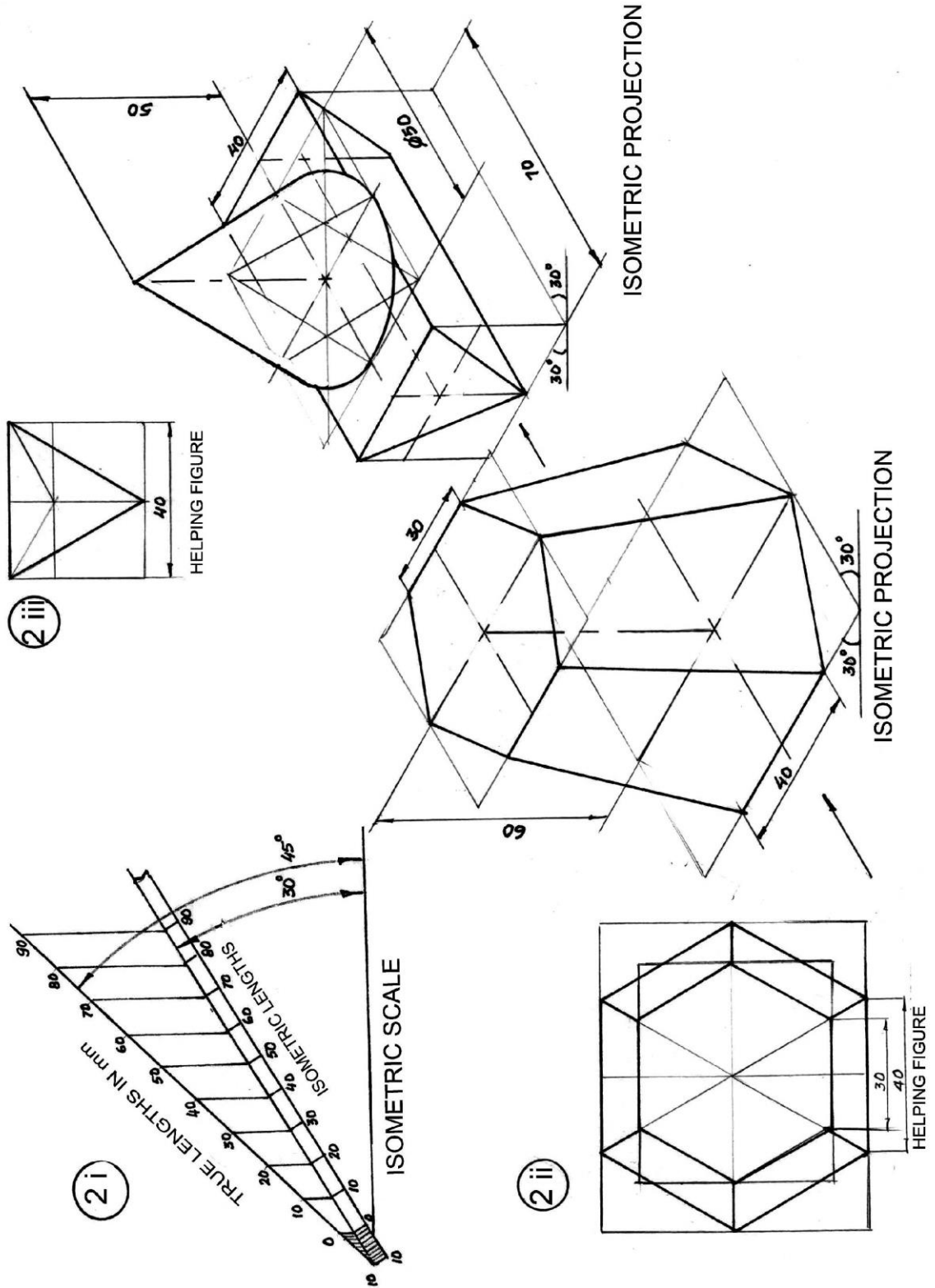
**FLANGE PIPE JOINT (Dis-assembly)**

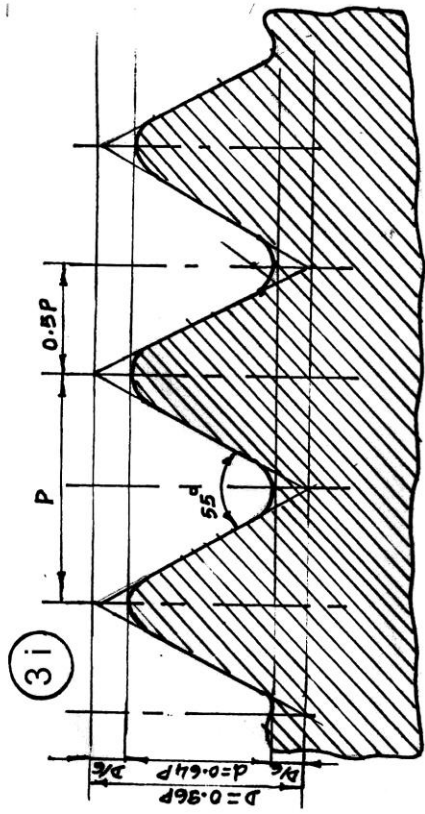
- 1) FLANGE B:
- |  |                               |
|--|-------------------------------|
| (i) <u>FRONT VIEW</u> (Upper Half in Section) :  | <b>8</b>                      |
| (a) Flange in upper half(2), hole for bolt(1), broken end as per convention(1), hatching(1). | 5                             |
| (b) Flange in lower half.  | 3                             |
| (ii) <u>SIDE VIEW</u> (Viewed from right side) :   | <b>8</b>                      |
| (a) Four circles(4), one pitch circle diameter( <sup>1</sup> / <sub>2</sub> ).               | 4 <sup>1</sup> / <sub>2</sub> |
| (b) Drawing four holes for bolt.   | 2                             |
| (c) Hatching as per convention.  | 1                             |
| (d) Cutting plane.   | 1 <sup>1</sup> / <sub>2</sub> |
- 2) GASKET
- |  |          |
|--|----------|
| (i) <u>FRONT VIEW</u> (Full in Section): | <b>3</b> |
| (a) Boundry with two horizontal lines.   | 2        |
| (b) Shading for rubber.                  | 1        |

- (ii) SIDE VIEW (Viewed from left side) : **3**
- (a) Two circles.  $2\frac{1}{2}$
- (b) Cutting plane.  $\frac{1}{2}$

DETAILS : **6**

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



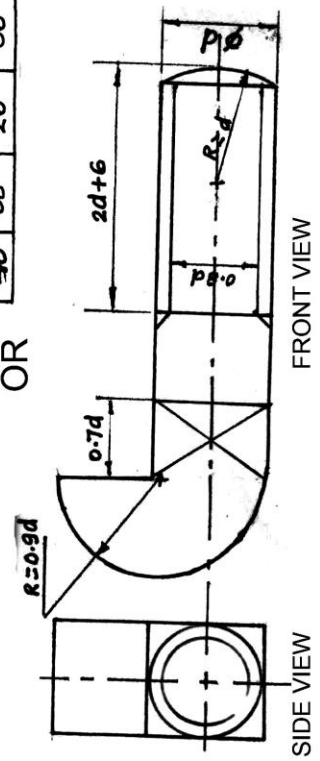


3 i

B.S.W. THREAD

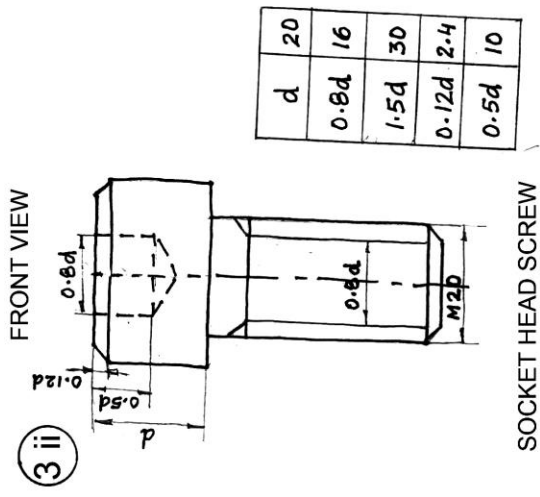
P	D	d	D/6
40	38	26	06

OR



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

HOOK BOLT

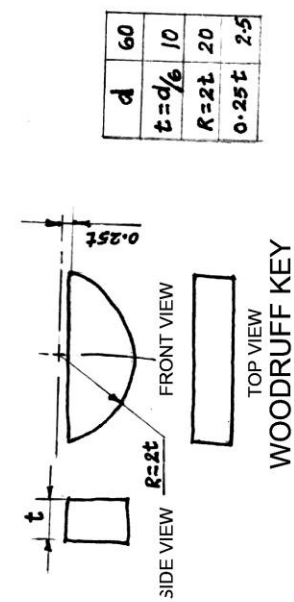


3 ii

SOCKET HEAD SCREW

d	20
0.8d	16
1.5d	30
0.12d	2.4
0.5d	10

OR



d	60
t = d/6	10
R = 2t	20
0.25t	2.5

WOODRUFF KEY





