

## 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  $\pm 1.0$  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 of Marks</u>
<b>Q 1.</b>	<b><u>MULTIPLE CHOICE QUESTIONS</u></b>	<b>5</b>
	(i) (d) <i>or</i> Thin Continuous Lines.	1
	(ii) (a) <i>or</i> External square threads.	1
	(iii) (a) <i>or</i> To facilitate the withdrawal of the key without disturbing the setting of the Hub.	1
	(iv) (b) <i>or</i> To support the moving shaft.	1
	(v) (c) <i>or</i> Key.	1
<b>Q 2. (i)</b>	<b><u>ISOMETRIC SCALE</u></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) <u>ISOMETRIC PROJECTION OF A FRUSTUM OF A TRIANGULAR PYRAMID</u></b>	<b>7</b>
(i) Drawing helping figure of both triangles.	$1\frac{1}{2}$
(ii) Drawing isometric triangle, on top and at the base.	2
(iii) Drawing three slant edges.	$1\frac{1}{2}$
(iv) Marking the vertical axis ( $\frac{1}{2}$ ) and direction of viewing ( $\frac{1}{2}$ ).	1
(v) Dimensions.	1

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

<b>(iii) <u>ISOMETRIC PROJECTION OF A HEXAGONAL PRISM PLACED, CENTRALLY, ON A HEMISPHERE</u></b>	<b>13</b>
<u>HEMISPHERE</u>	<b>6</b>
(i) Drawing isometric ellipse ( $2\frac{1}{2}$ ) along with centre lines ( $\frac{1}{2}$ ).	3
(ii) Drawing semicircular portion of hemisphere.	$1\frac{1}{2}$
(iii) Marking the vertical axis.	$\frac{1}{2}$
(iv) Dimensions.	1
<u>HEXAGONAL PRISM</u>	<b>7</b>
(i) Drawing helping figure.	1
(ii) Drawing both isometric hexagons.	2
(iii) Drawing vertical edges.	2
(iv) Marking the vertical axis ( $\frac{1}{2}$ ) and direction of viewing ( $\frac{1}{2}$ ).	1
(v) Dimensions.	1

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

<b>Q 3. (i) <u>HOOK BOLT</u></b>	<b>8</b>
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.  $2\frac{1}{2}$

(ii) Side view.  $1\frac{1}{2}$

(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  $\phi 10$  on a P.C.D. of  $\phi 90$ .  $3\frac{1}{2}$

(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  $\phi 10$  on a P.C.D. of  $\phi 90$ .  $3\frac{1}{2}$

- (c) Hatching in lower half portion of flanges. 2
- (d) Drawing bolt and nut of  $\phi$  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,  $\phi$ 10 circle (thick) and conventional thread circle on P.C.D. (corresponding to Front View at least).  $2\frac{1}{2}$
- (d) Drawing cutting plane.  $\frac{1}{2}$

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

[OR]

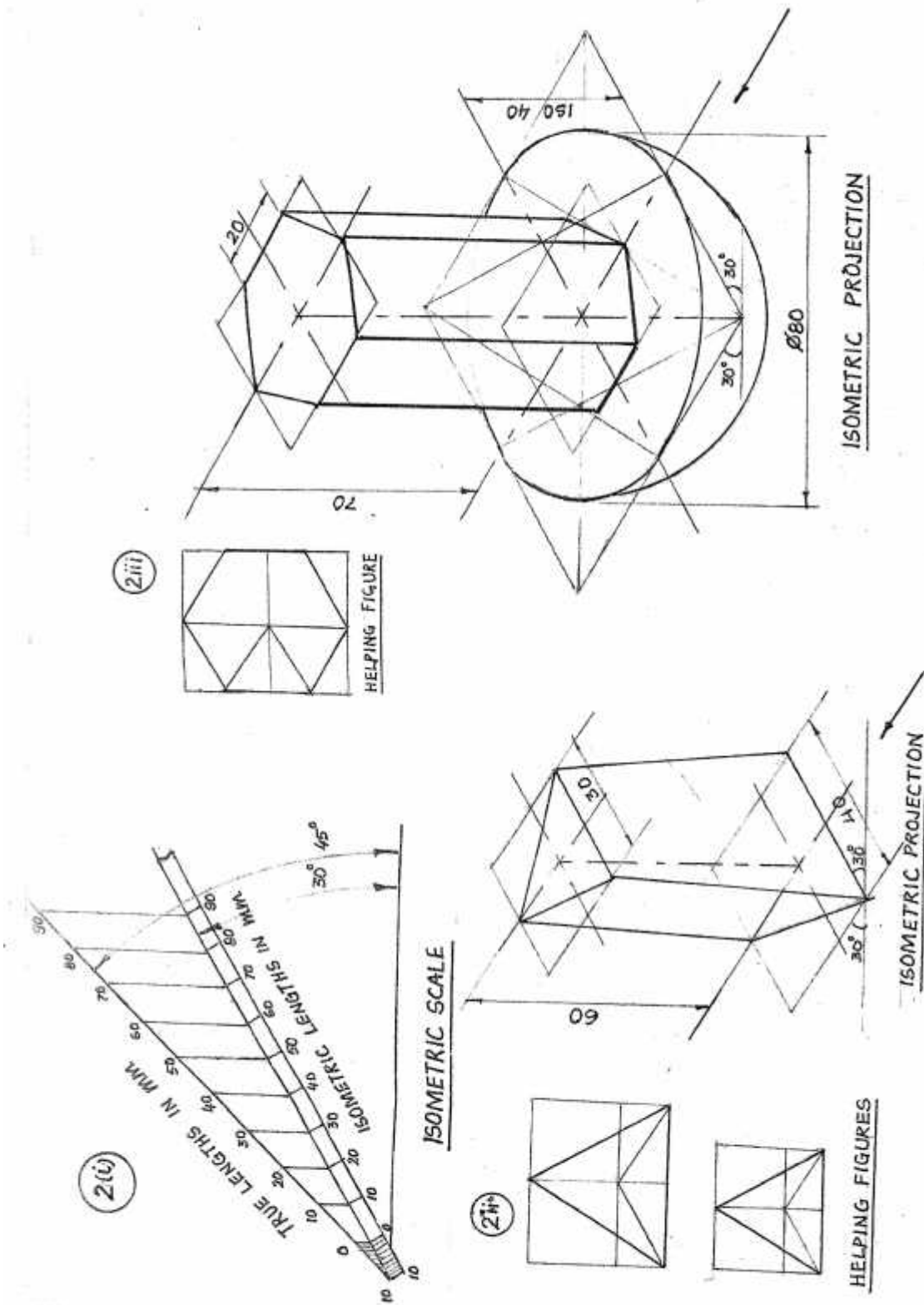
**SLEEVE AND COTTER JOINT (Dis-assembly)**

- (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  $\phi$ 72 (2) and circle of  $\phi$ 36 ( $1\frac{1}{2}$ )  $3\frac{1}{2}$
- (b) Hidden lines for cotter holes. 3
- (c) Cutting plane.  $\frac{1}{2}$
- (B) COTTER A
- (i) FRONT VIEW (Full in Section): 4
- (a) Boundary of cotter with taper. 2
- (b) Arcs. 2

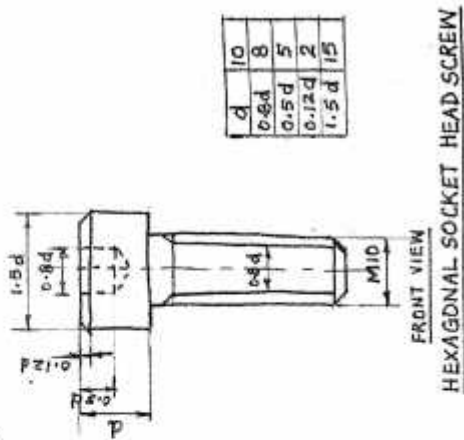
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|---|----------|
| (ii) <u>TOP VIEW</u>                    | <b>3</b> |
| (a) Boundary with vertical hidden line. | 2        |
| (b) Arcs.                               | 1        |

DETAILS : **6**

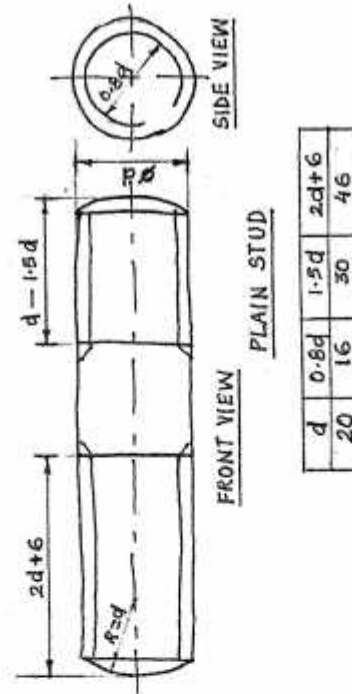
Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3).



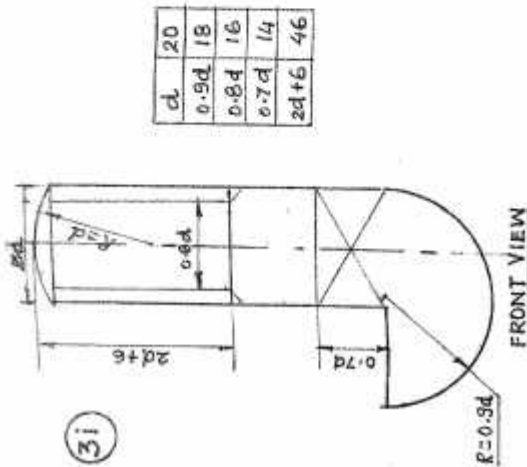
3ii



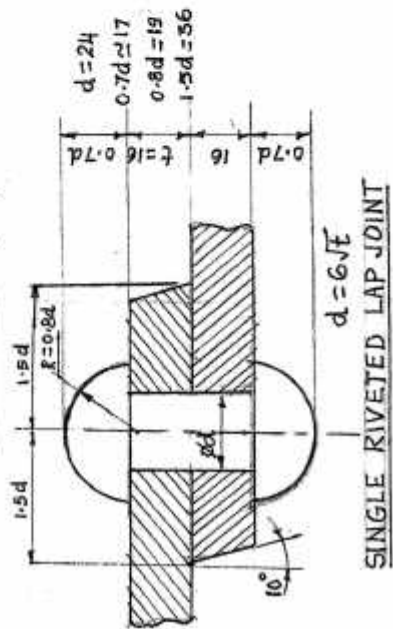
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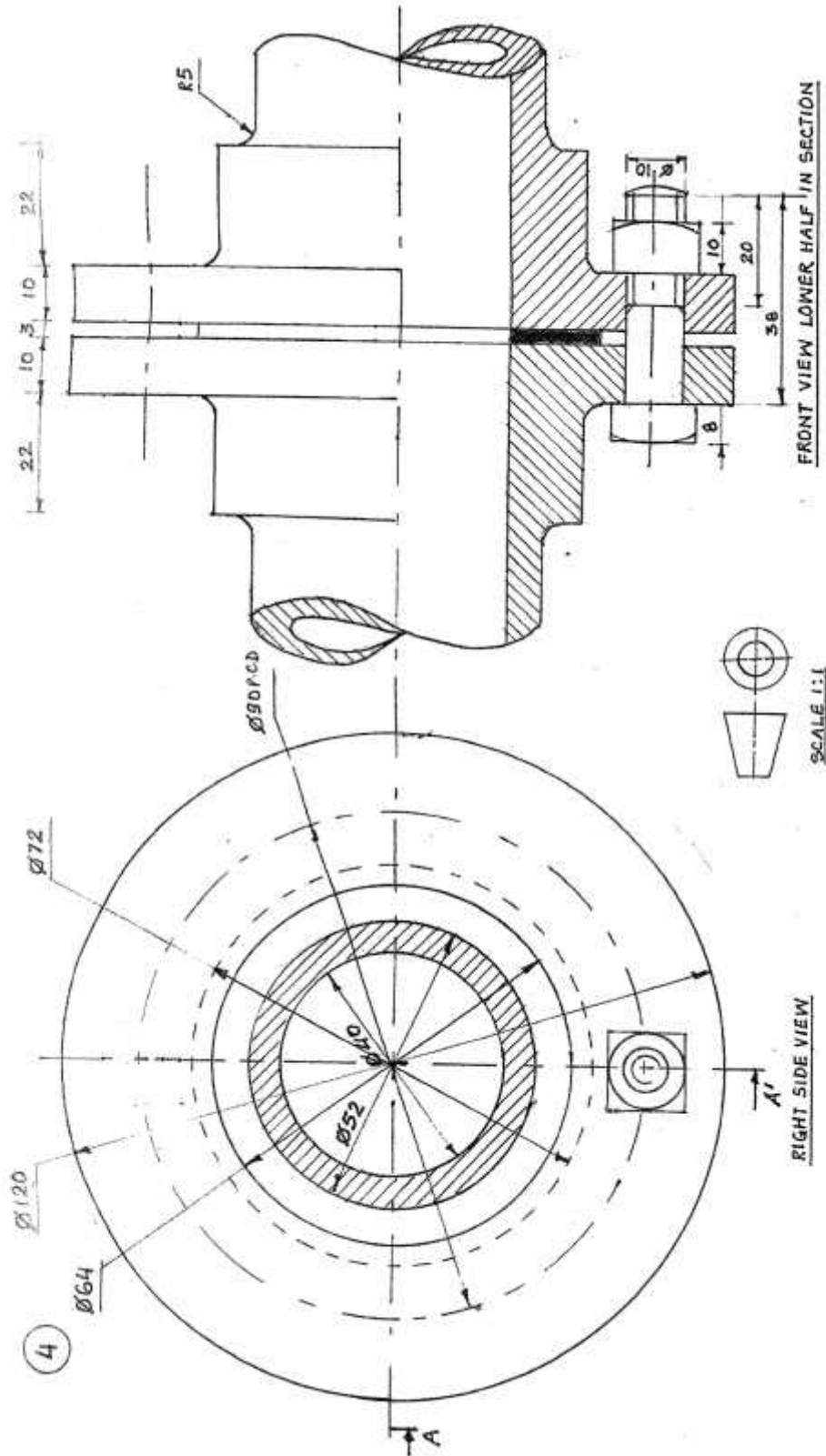


3i



(OR)





ASSEMBLY OF FLANGED PIPE JOINT



