

MARKING SCHEME

Senior School Certificate Examination – 2018

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

ALL QUESTIONS ARE TO BE ANSWERED CORRECTLY AND ACCURATELY.

General Note:

- a) The marking scheme carries only suggested value points for the answers. These are only Guidelines and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the marks be awarded accordingly.
- b) Marks are to be awarded in proportion to the work done.
- c) Mistakes in dimensioning up to ± 1.0 mm may be ignored.
- d) 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.
- e) In question no. 2 and in sectioned view of question no. 4, if hidden edges / lines are drawn, no marks should be deducted.
- f) Other standard methods of drawing / proportions for features like nuts, heads of bolts, screws etc. employed by examinees, may also be accepted.
- g) The answers/solutions must be evaluated adhering to marking scheme and no marks should be deducted without mistake.

VALUE POINTS

	<u>Distribution of Marks</u>
1. <u>MULTIPLE CHOICE QUESTIONS</u>	5
(i) (b) or Frustum.	1
(ii) (b) or Overlapping each other.	1
(iii) (a) or Woodruff key.	1
(iv) (a) or Gasket.	1
(v) (d) or To keep the belt in the middle of the rim.	1
2. (i) <u>ISOMETRIC SCALE</u>	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	1

Length/Isometric Scale' and marking angles of 30° & 45° .

(ii) ISOMETRIC PROJECTION OF A TRIANGULAR PYRAMID	7
(i) Drawing helping figure of triangle.	1
(ii) Drawing isometric triangle keeping one base edge perpendicular to V.P. either at left or at right.	2
(iii) Drawing slant edges.	2
(iv) Marking the axis ($1/2$) and direction of viewing ($1/2$).	1
(v) Dimensions.	1

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

(iii) ISOMETRIC PROJECTION OF A SPHERE PLACED, CENTRALLY, ON A HEXAGONAL FACE OF A HEXAGONAL PRISM	13
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<u>HEXAGONAL PRISM</u>	7
(i) Drawing helping figure.	1
(ii) Drawing both isometric hexagons.	3
(iii) Drawing vertical edges.	2
(iv) Dimensions.	1

<u>SPHERE</u>	6
(i) Locating the centre of sphere with isometric radius.	1
(ii) Drawing the circle of sphere with true radius.	$2\frac{1}{2}$
(iii) Marking the common axis (1), direction of viewing ($1/2$).	$1\frac{1}{2}$
(iv) Dimensions.	1

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

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 crests (1), roots (1) of threads (minimum two) and flanks (1), drawn correctly.	3
(iii) Drawing hatching lines and conventional break.	1
(iv) Standard dimensions.	2

[OR]

<u>SQUARE HEADED BOLT</u> (with axis vertical)	8
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(a) <u>FRONT VIEW</u> (A/F or A/C):	
(i) Drawing shank of the bolt with threaded length.	$1\frac{1}{2}$

- | | |
|---|-------------------------------|
| (ii) Drawing head of the bolt with chamfering arc. | 1 ¹ / ₂ |
| (b) <u>SIDE VIEW</u> : | |
| (i) Drawing shank of the bolt with threaded length. | 1 ¹ / ₂ |
| (ii) Drawing head of the bolt with chamfering arc. | 1 ¹ / ₂ |
| (c) Standard dimensions. | 2 |

As the front view and side view are identical, under the given condition, the dilemma of examinee is considered. If the examinee has attempted front view only with vertical axis or horizontal axis, then the marks allotted to side view will be added to front view.

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

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|--|-------------------------------|
| (ii) GRUB SCREW | 5 |
| (i) Front view with its axis vertical. | 2 ¹ / ₂ |
| (ii) Top view. | 1 ¹ / ₂ |
| (iii) Standard dimensions. | 1 |

[OR]

- | | |
|--|-------------------------------|
| <u>FLAT HEAD RIVET</u> | 5 |
| (i) Front view with its axis vertical. | 2 ¹ / ₂ |
| (ii) Top 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.

4. SOCKET AND SPIGOT COTTER JOINT (Assembly)

- | | |
|--|-----------|
| (i) <u>FRONT VIEW</u> (Upper Half in Section) : | 14 |
| (a) Drawing upper half portion of socket (2), spigot (2), clearance on both sides of cotter ($\frac{1}{2} + \frac{1}{2}$) and 4 mm clearance between inner walls of socket and spigot (1). | 6 |
| (b) Drawing lower half portion of socket (2), spigot (2). | 4 |
| (c) Drawing the cotter. | 2 |
| (d) Drawing the hatching lines. | 2 |
| (ii) <u>SIDE VIEW</u> (looking from left): | 8 |
| (a) Drawing five circles (5) along with conventional hatching lines (1). | 6 |

- | | | |
|-----|-----------------------------------|-------------------------------|
| (b) | Drawing cotter with hidden lines. | 1 ¹ / ₂ |
| (c) | Drawing cutting plane. | 1/2 |

DETAILS :**6**

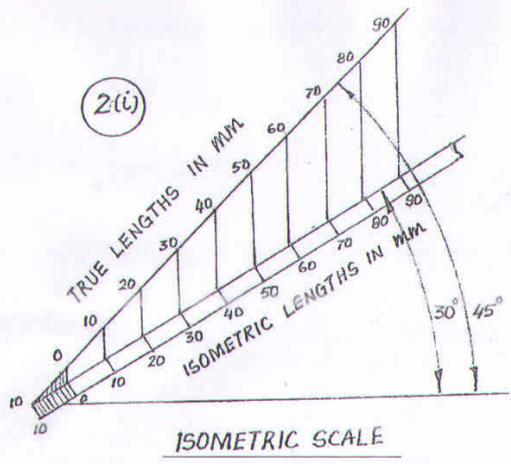
Printing title (1), scale used (1), drawing projection symbol (1) and six dimensions (3).

[OR]**BUSHED BEARING (Dis-assembly)**

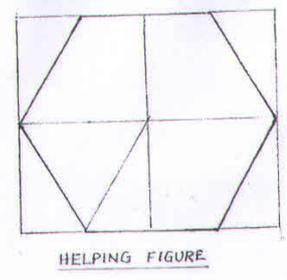
- | | | |
|-------|---|-------------------------------|
| (i) | BODY | |
| (a) | <u>FRONT VIEW</u> (Left Half in Section) : | 8 |
| (i) | Drawing the left half portion of body (2) with recess of 4 mm in base plate (1). | 3 |
| (ii) | Drawing hole of 20X10 (1) and oil hole (1). | 2 |
| (iii) | Hatching lines | 1 |
| (iv) | Drawing the right half portion of body with centre line of hole of 20X10. | 2 |
| (b) | <u>TOP VIEW</u> : | 7 |
| (i) | Drawing the entire boundary (2 ¹ / ₂) with hidden lines (2). | 4 ¹ / ₂ |
| (ii) | Drawing holes (rectangular or elongated circular) (1) and both circles of oil hole (1). | 2 |
| (iii) | Cutting plane. | 1/2 |
| (ii) | BUSH | |
| (a) | <u>FULL SECTIONAL FRONT VIEW:</u> | 4 |
| (i) | Two circles. | 2 |
| (ii) | Oil hole. | 1 |
| (iii) | Hatching lines. | 1 |
| (b) | <u>TOP VIEW</u> : | 3 |
| (i) | Rectangular boundary (1), hidden line (1/2) with circle of oil hole (1). | 2 ¹ / ₂ |
| (ii) | Cutting plane. | 1/2 |

DETAILS :**6**

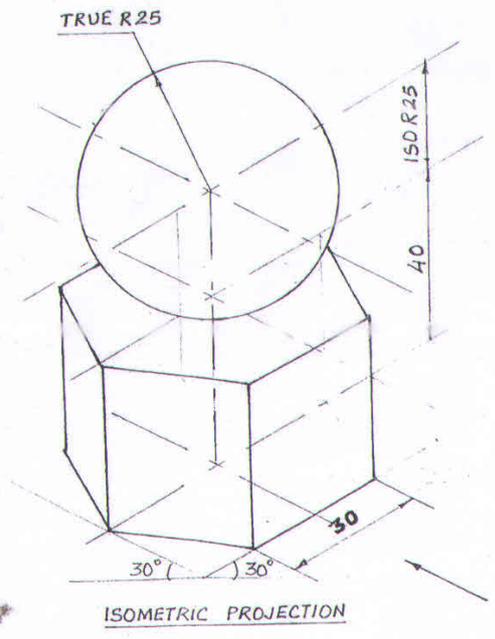
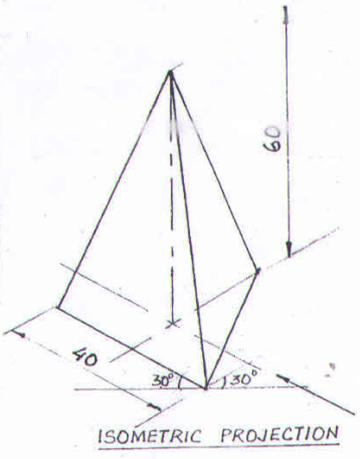
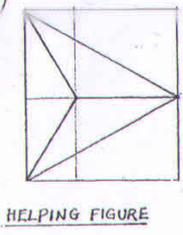
Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3).



2(iii)

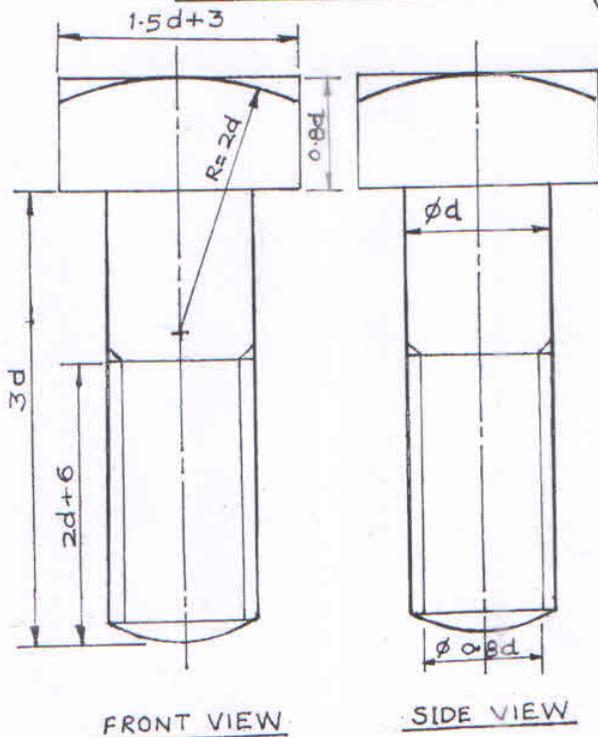


2(ii)



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SQUARE HEAD BOLT

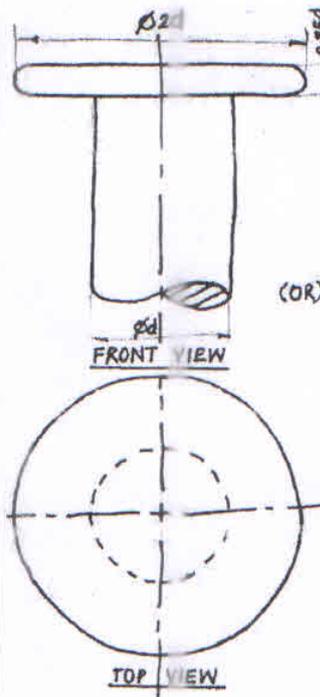


d	0.8d	1.5d+3	2d	2d+6	3d
25	20	40.5	50	56	75

(OR)

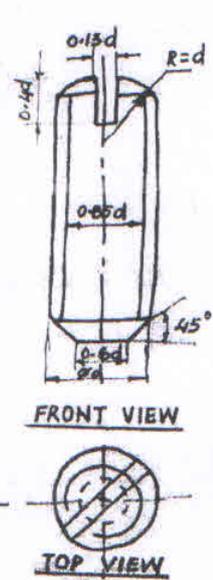
3ii

FLAT HEAD RIVET



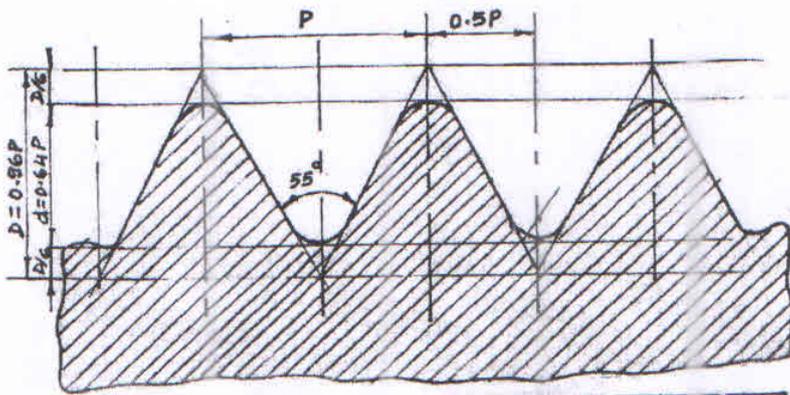
d	25
0.25d	06
2d	50

GRUB SCREW



d	20
0.13d	2.6
0.6d	12
0.65d	17

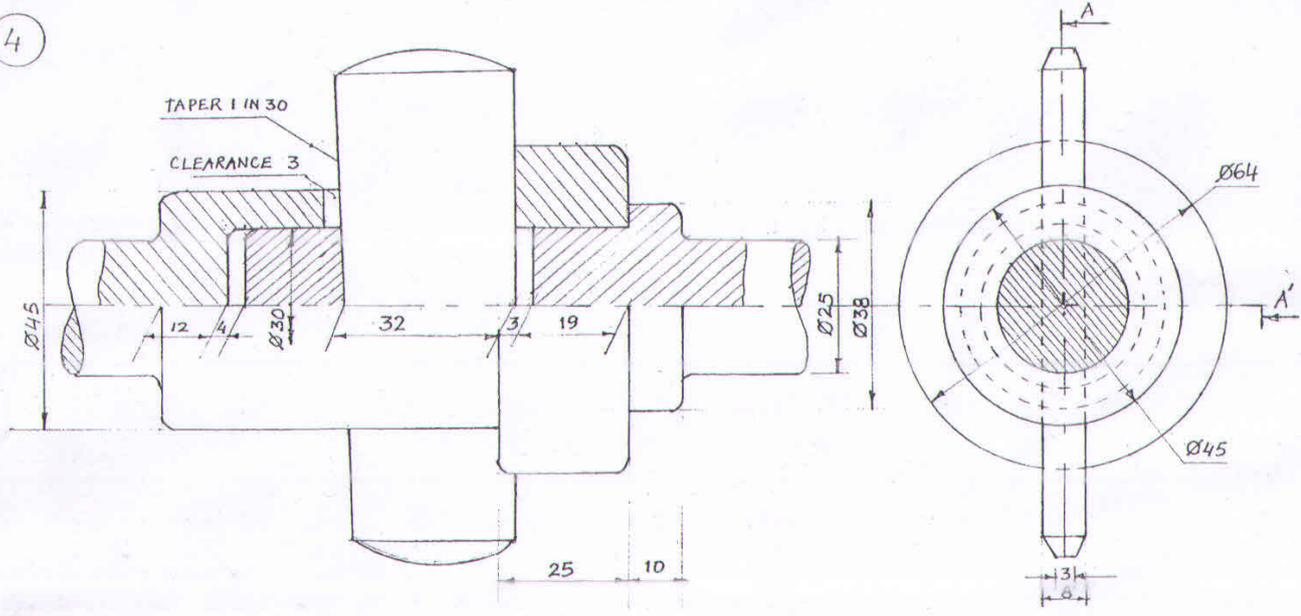
3i



BS.W. THREAD

P	D	d	$\frac{D}{6}$
50	48	32	8

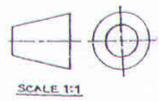
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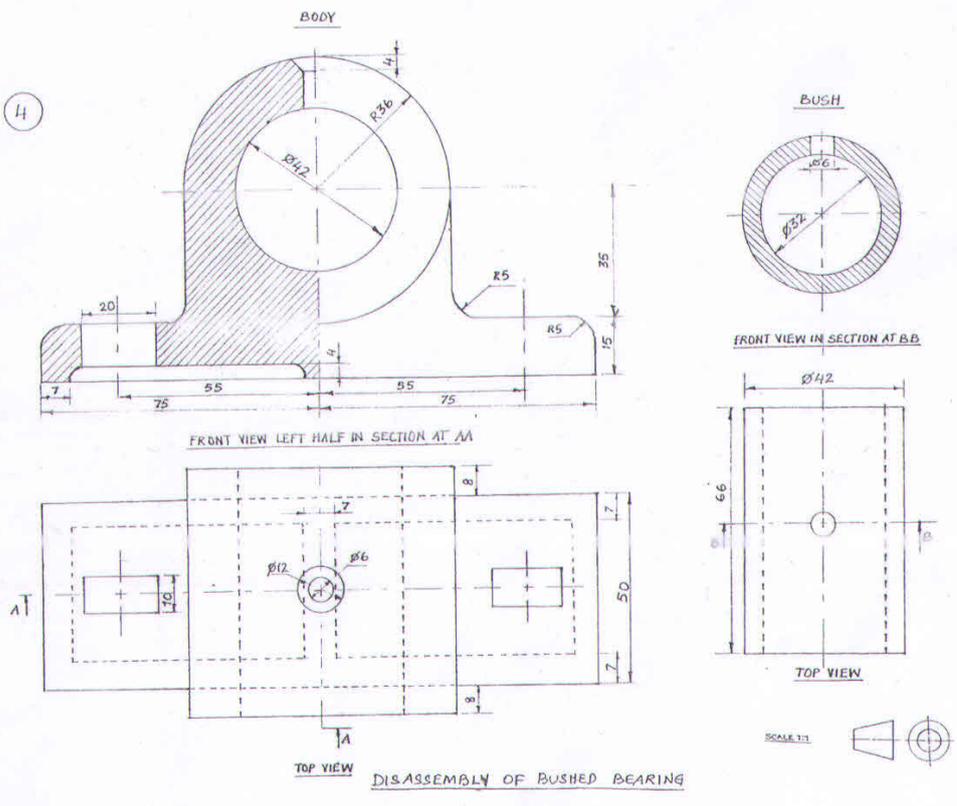
FRONT VIEW UPPER HALF SECTION AT AA'

LEFT SIDE VIEW

ASSEMBLY OF SOCKET AND SPIGOT COTTER JOINT



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