

MARKING SCHEME

Senior School Certificate Examination – 2013

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

ALL QUESTIONS ARE TO BE ANSWERED CORRECTLY AND ACCURATELY.

General Note:

- (i) Marks are to be awarded in proportion to the work done.
- (ii) Mistakes in dimensioning up to ± 1.0 mm may be ignored.
- (iii) In dimensioning, arrow-heads of various types, as per SP: 46-2003 codes are usable. However, where space is too small for an arrowhead, oblique stroke or dot may be employed.
- (iv) In no view of question 1 and in no sectioned view of question 3, are hidden edges / lines required.
- (v) 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>S. No.</u>		<u>Distribution of Marks</u>
Q 1.	ISOMETRIC SCALE	3
	(i) Marking of divisions of 10 mm, 1 mm on true length and marking angles of 30° & 45° .	1
	(ii) Projections from scale 1:1 to get points on isometric scale, Construction of isometric scale.	1
	(iii) Division of the first part of isometric scale into 10 subdivisions. Printing 'True Length/Scale 1:1' and 'Isometric Length/Isometric Scale'.	1
(a):	ISOMETRIC PROJECTION OF FRUSTUM OF A SQUARE PYRAMID	7
	(i) Drawing isometric square on top, of side 50 mm, with centre lines.	2
	(ii) Drawing isometric square, at the base, of side 60 mm, with centre lines.	1
	(iii) Drawing slant edges (three).	$1\frac{1}{2}$
	(iv) Marking the vertical axis, direction of viewing.	1
	(v) Dimensions.	$1\frac{1}{2}$

NOTE: For incorrect position of the frustum i.e. drawn in inverted position or if axis is kept horizontal, $1\frac{1}{2}$ marks should be deducted.

(b):	ISOMETRIC PROJECTION OF HEMISPHERE PLACED, CENTRALLY, ON A HEXAGONAL PRISM	14
	<u>HEXAGONAL PRISM</u>	7
	(i) Drawing a helping figure of a hexagon, base edge = 30 mm, with two of its base edges parallel to V.P.	1
	(ii) Drawing isometric hexagons.	3
	(iii) Drawing face edges, parallel to vertical axis.	2
	(iv) Dimensions.	1
	<u>HEMISPHERE</u>	7
	(i) Drawing isometric ellipse with centre lines.	3
	(ii) Drawing semicircular portion of hemisphere	$1\frac{1}{2}$
	(iii) Marking the common vertical axis and direction of viewing.	$1\frac{1}{2}$
	(iv) Dimensions.	1

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

Q 2. (a):	<u>BSW THREAD PROFILE</u>	8
	(i) Distance, equal to pitch, marked correctly and angles of 55° , drawn correctly.	2
	(ii) Curves for threads (minimum two), drawn correctly.	3
	(iii) Side edges (flanks), drawn correctly.	1
	(iv) Dimensions and hatching lines.	2

[OR]

	<u>SINGLE RIVETED LAP JOINT</u>	8
	(i) Drawing rivet with both heads.	3
	(ii) Drawing both plates.	2
	(iii) Drawing hatching lines.	1
	(iv) Dimensions (at least four).	2

NOTE: BSW thread profile may be drawn either internal or external. 3 marks may be deducted, in all, if sketched freehand, instead of drawing to scale 1:1.

Q 2 (b):	<u>COLLAR STUD</u>	5
	(i) Front view with its axis horizontal.	2½
	(ii) Side view.	1½
	(iii) Dimensions.	1

[OR]

	<u>GRUB SCREW</u>	5
	(i) Front view with its axis vertical.	2
	(ii) Top view.	2
	(iii) Dimensions.	1

NOTE: 2 marks may be deducted, if these components are drawn with instruments, instead of being sketched freehand.

Q 3 :	<u>SOCKET AND SPIGOT JOINT(Assembly)</u>	28
	(a) <u>FRONT VIEW</u> (Upper Half in Section) :	14
	(i) Drawing upper half portion of socket and spigot arrangement, clearance of 3 mm on both sides of cotter and 5 mm clearance between inner walls of socket and spigot arrangement.	7
	(ii) Drawing lower half portion, socket and spigot arrangement including hatching lines in broken end of rods.	3
	(iii) Drawing cotter, upper half and lower portion out of socket.	2
	(iv) Hatching lines.	2
	(b) <u>SIDE VIEW</u> (viewed from left):	8
	(i) Drawing five circles.	5
	(ii) Drawing hatching lines to indicate the rod diameter.	1
	(iii) Drawing cotter.	1½
	(iv) Cutting plane.	½
	<u>DETAILS :</u>	6
	Printing title (1), scale used (1), drawing projection symbol (1) and six dimensions (3).	

[OR]

PROTECTED FLANGE COUPLING (Dis-assembly) **28****(1) FLANGE-A**

- | | |
|---|----------------|
| (a) <u>FRONT VIEW</u> (Lower Half in Section) : | 8 |
| (i) Drawing the lower, sectioned half of flange. | 3 |
| (ii) Drawing the lower half portion of flange. | 2 |
| (iii) Drawing hole of $\varnothing 10$ mm and 3 mm extended portion of $\varnothing 58$ mm. | 2 |
| (iv) Hatching lines. | 1 |
|
 | |
| (b) <u>SIDE VIEW</u> (Viewed from left) : | 8 |
| (i) Drawing five circles (5) and pitch circle for bolts($1/2$). | $5\frac{1}{2}$ |
| (ii) Drawing keyway (1) and hole of $\varnothing 10$ mm(1). | 2 |
| (iii) Drawing cutting plane. | $1/2$ |

(2) SHAFT-A

- | | |
|--|----------|
| (a) <u>FRONT VIEW</u> : | 3 |
| (i) Drawing the shaft with broken end. | 2 |
| (ii) Drawing keyway. | 1 |
|
 | |
| (b) <u>SIDE VIEW</u> (Viewed from right) : | 3 |
| (i) Drawing one circle. | 2 |
| (ii) Drawing keyway. | 1 |

DETAILS :**6**

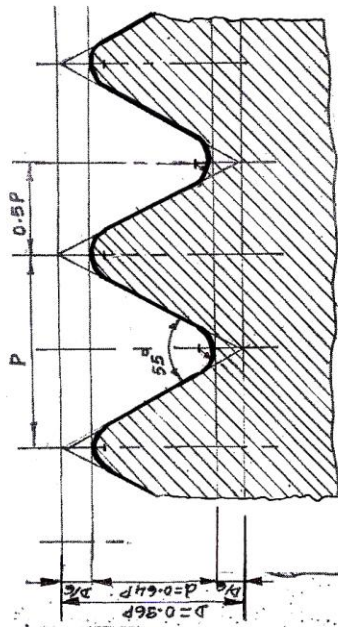
Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3).

Q 4 : MULTIPLE CHOICE QUESTIONS **5**

- | | |
|-----------------------------------|---|
| (i) (c) or 15° . | 1 |
| (ii) (b) or 60° . | 1 |
| (iii) (c) or $D/4$. | 1 |
| (iv) (b) or Simple Plummer Block. | 1 |
| (v) (c) or 30° . | 1 |

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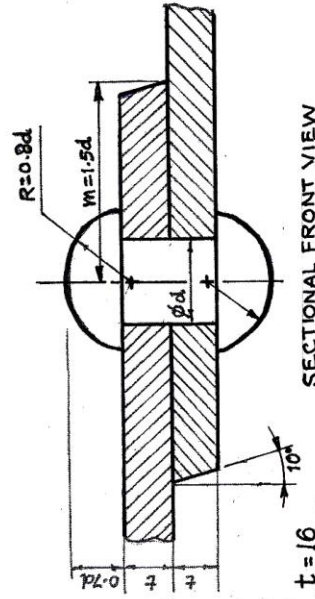
2a



B.S.W. THREAD

P=50

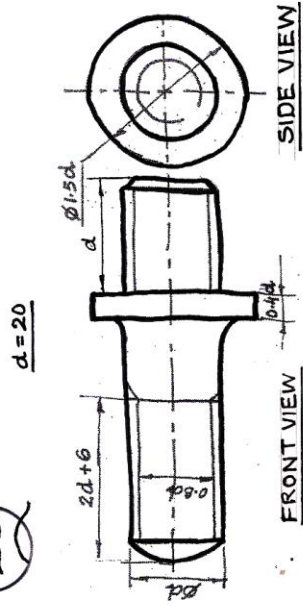
OR



SECTIONAL FRONT VIEW

SINGLE RIVETED LAP JOINT

2b

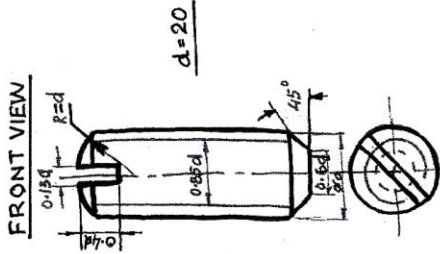


FRONT VIEW

COLLAR STUD

SIDE VIEW

OR



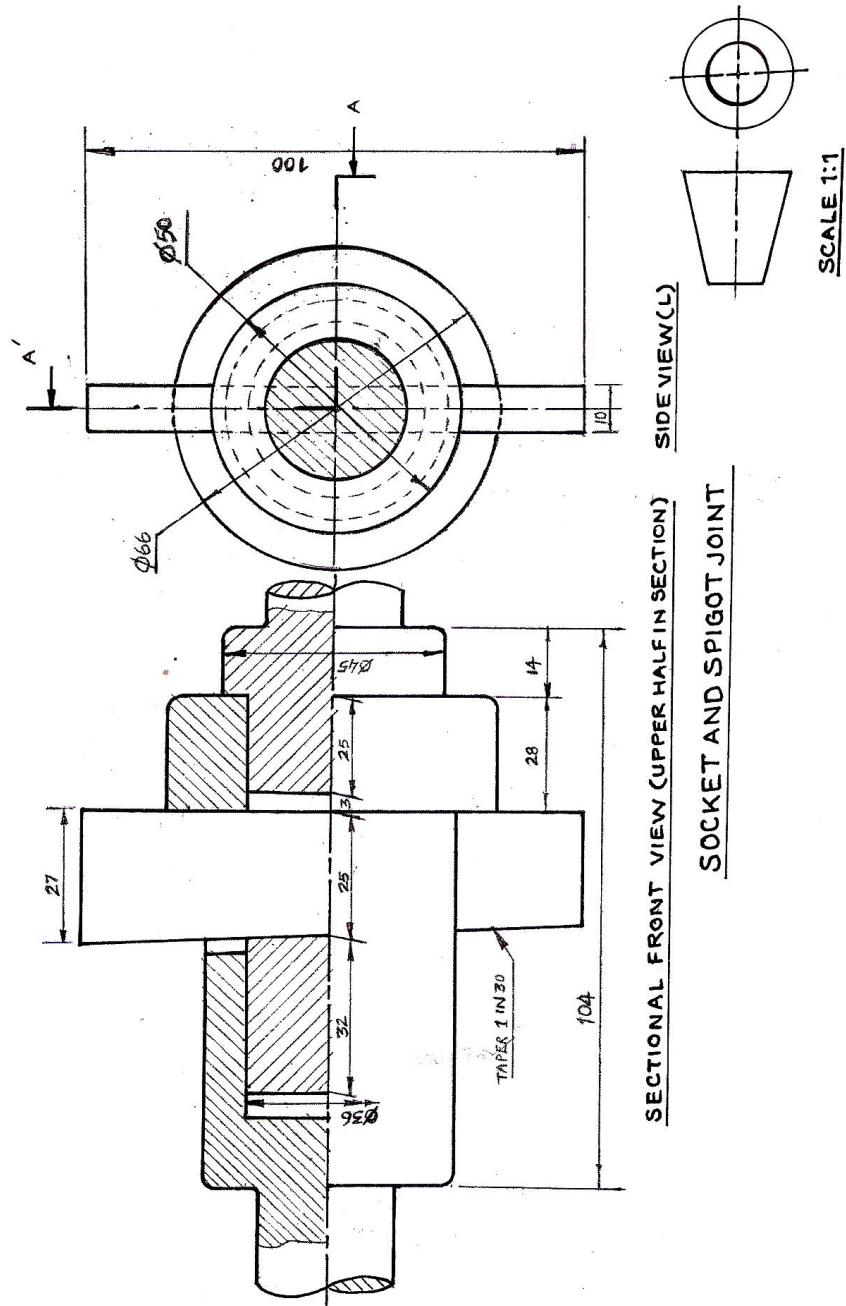
FRONT VIEW

TOP VIEW

GRUB SCREW

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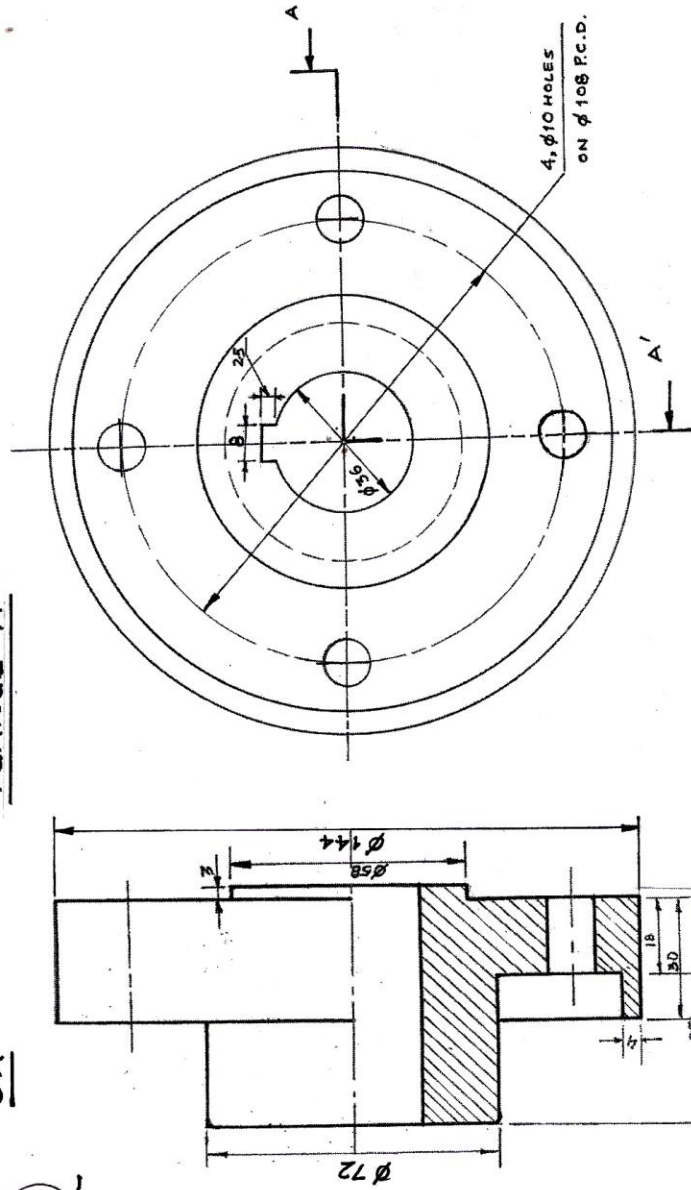
3



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3

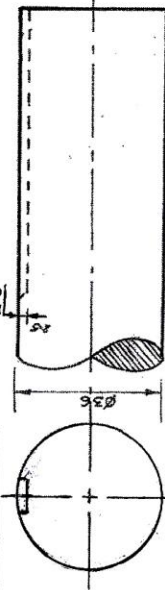
FLANGE - "A"

OR



SIDE VIEW (L)

HALF SECTIONAL FRONT VIEW A-A'



SCALE 1:1

FRONT VIEW

SIDE VIEW

SHAFT "A"