

MARKING SCHEME

Senior School Certificate Examination – 2013

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

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 A HEXAGONAL PYRAMID	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 hexagon.	2
	(iii) Drawing slant edges.	2
	(iv) Marking the vertical axis, direction of viewing.	1
	(v) Dimensions.	1

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

(b): ISOMETRIC PROJECTION OF SPHERE PLACED, CENTRALLY, ON A PENTAGONAL PRISM **14**

PENTAGONAL PRISM **8**

- (i) Drawing a helping figure of a pentagon, base edge = 30 mm, with one of its base edge perpendicular to V.P. **1**
- (ii) Drawing isometric pentagons. **3 $\frac{1}{2}$**
- (iii) Drawing face edges, parallel to vertical axis. **2 $\frac{1}{2}$**
- (iv) Dimensions. **1**

SPHERE **6**

- (i) Marking the centre ($\frac{1}{2}$), centre lines (1) and sphere (2). **3 $\frac{1}{2}$**
- (ii) Marking the common vertical axis (1) and direction of viewing ($\frac{1}{2}$). **1 $\frac{1}{2}$**
- (iii) Dimensions. **1**

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

Q 2. KNUCKLE THREAD PROFILE **8**

(a):

- (i) Distance, equal to pitch, marked correctly. **2**
- (ii) Semicircular profile for threads (minimum two), drawn correctly. **4**
- (iii) Dimensions and hatching lines. **2**

[OR]

SQUARE NUT **8**

FRONT VIEW :

- (i) Boundary lines with hidden lines showing threads with axis vertical and two opposite edges parallel to V.P. **2**
- (ii) Drawing arc with radius R. **1**

TOP VIEW :

- (i) Drawing three circles as per convention. **2**
- (ii) Square, circumscribing chamfer circle. **1**

DETAILS :

Dimensions.

2

NOTE: *Knuckle 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 ROUND HEAD SCREW 5**(b):**

- | | |
|--|---|
| (i) Front view with its axis vertical. | 2 |
| (ii) Top view. | 2 |
| (iii) Dimensions. | 1 |

[OR]**PAN HEAD RIVET 5**

- | | |
|--|-------------------------------|
| (i) Front view with its axis vertical. | 2 ¹ / ₂ |
| (ii) Top view. | 1 ¹ / ₂ |
| (iii) Dimensions. | 1 |

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

Q 3 : UNPROTECTED FLANGE COUPLING (Assembly) 28

- | | |
|--|-------------------------------|
| (a) <u>FRONT VIEW</u> (Lower Half in Section) : | 14 |
| (i) Drawing lower half portion of socket and spigot arrangement, clearance of 2 mm and hatching lines. | 5 |
| (ii) Drawing upper half portion of flanges. | 3 |
| (iii) Drawing nut bolt assembly (at least at one location). | 2 |
| (iv) Shafts with conventional ends. | 2 |
| (v) Keys and keyways. | 2 |
| (b) <u>SIDE VIEW</u> (viewed from left): | 8 |
| (i) Drawing five circles including pitch circle. | 2 ¹ / ₂ |
| (ii) Drawing nut bolt assembly (at least at one location). | 2 |
| (iii) Drawing both keys. | 2 |
| (iv) Drawing hatching lines to show the convention of rod end. | 1 |
| (v) Cutting plane. | 1 ¹ / ₂ |

DETAILS :**6**

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

[OR]

OPEN BEARING (Dis-assembly) **28**

(1) BASE

- | | |
|---|------------------|
| (a) <u>FRONT VIEW</u> (Right Half in Section) : | 8 |
| (i) Drawing right half with mounting hole and recess of 5 mm at bottom. | 5 |
| (ii) Drawing left half. | 2 |
| (iii) Hatching lines. | 1 |
| (b) <u>TOP VIEW</u> : | 7 |
| (i) Drawing boundary with six vertical lines. | 3 |
| (ii) Hidden lines | 2 |
| (iii) Drawing both mounting holes. | 1 ^{1/2} |
| (iv) Drawing cutting plane. | 1/2 |

(2) BUSH

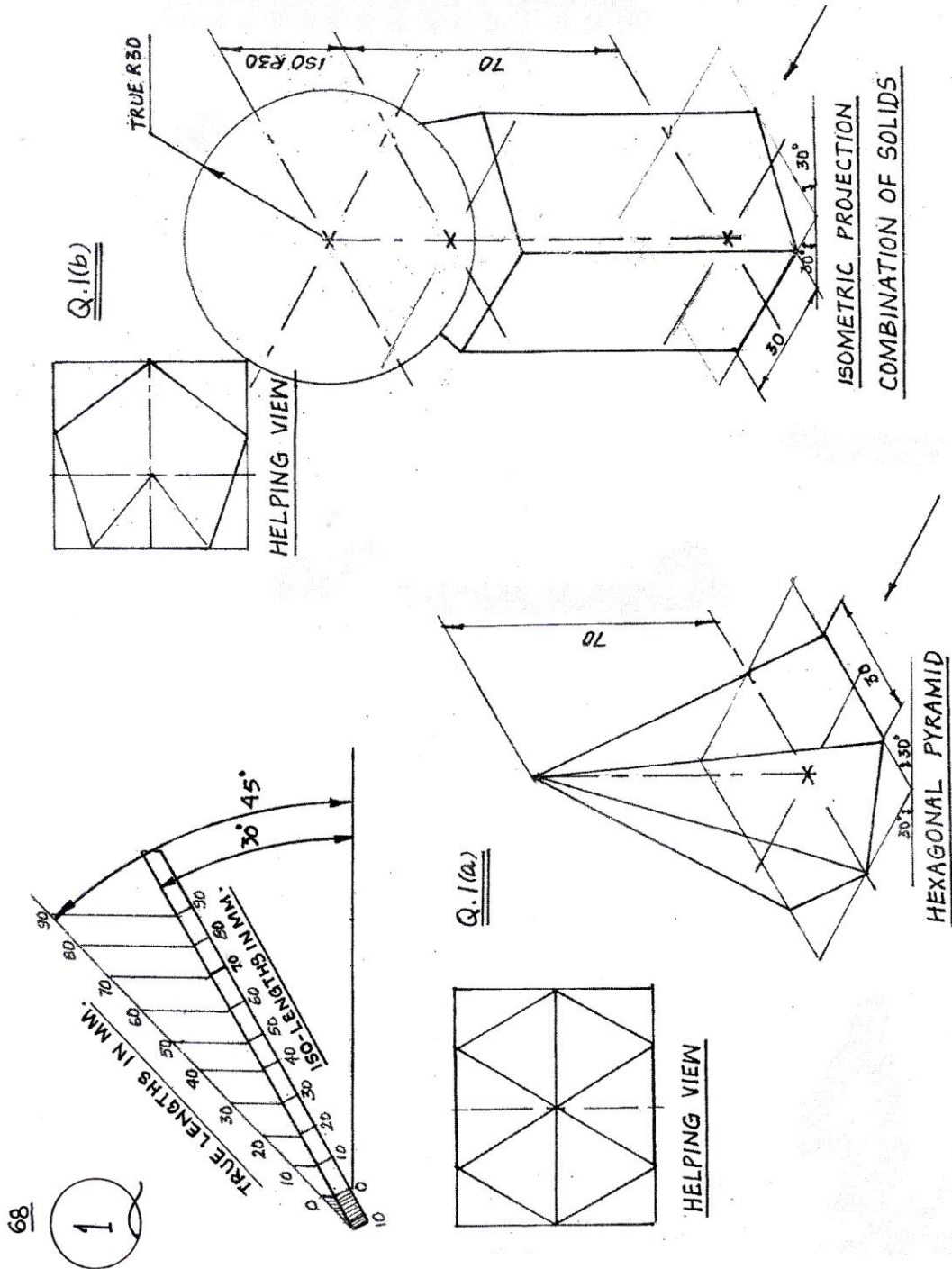
- | | |
|--|------------------|
| (a) <u>FRONT VIEW (Full Sectional)</u> : | 4 |
| (i) Drawing the complete view. | 3 |
| (ii) Hatching lines. | 1 |
| (b) <u>TOP VIEW</u> : | 3 |
| (i) Drawing the complete view. | 2 ^{1/2} |
| (ii) Drawing cutting plane. | 1/2 |

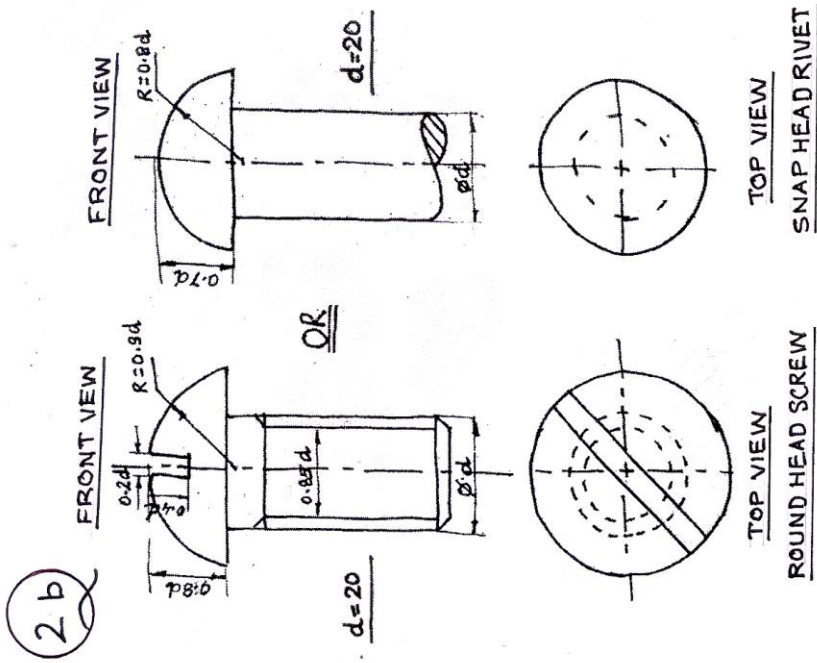
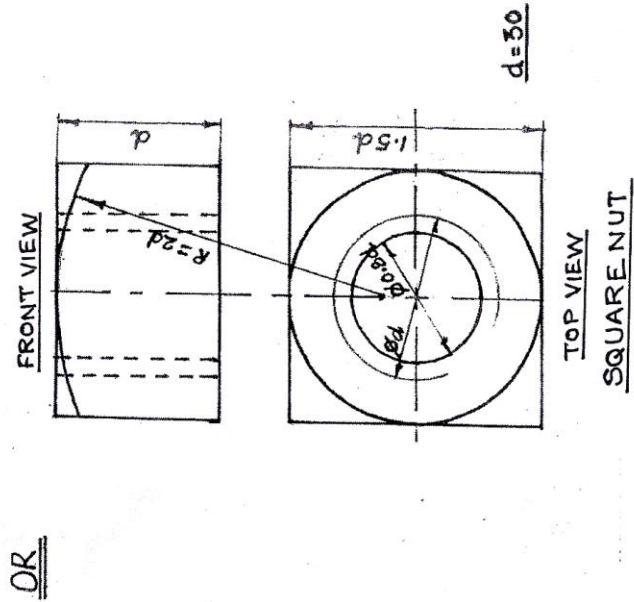
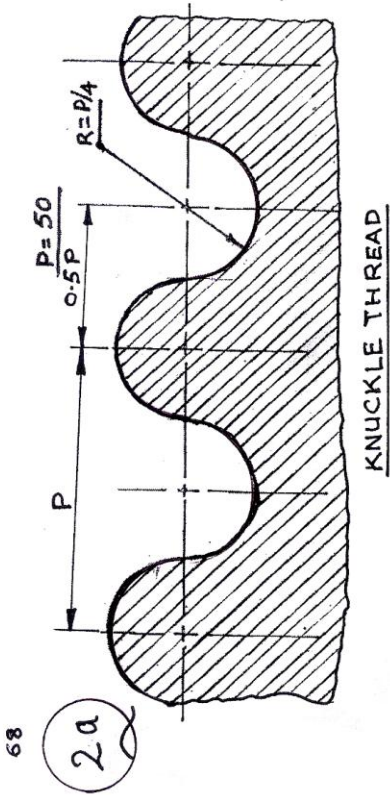
DETAILS : **6**

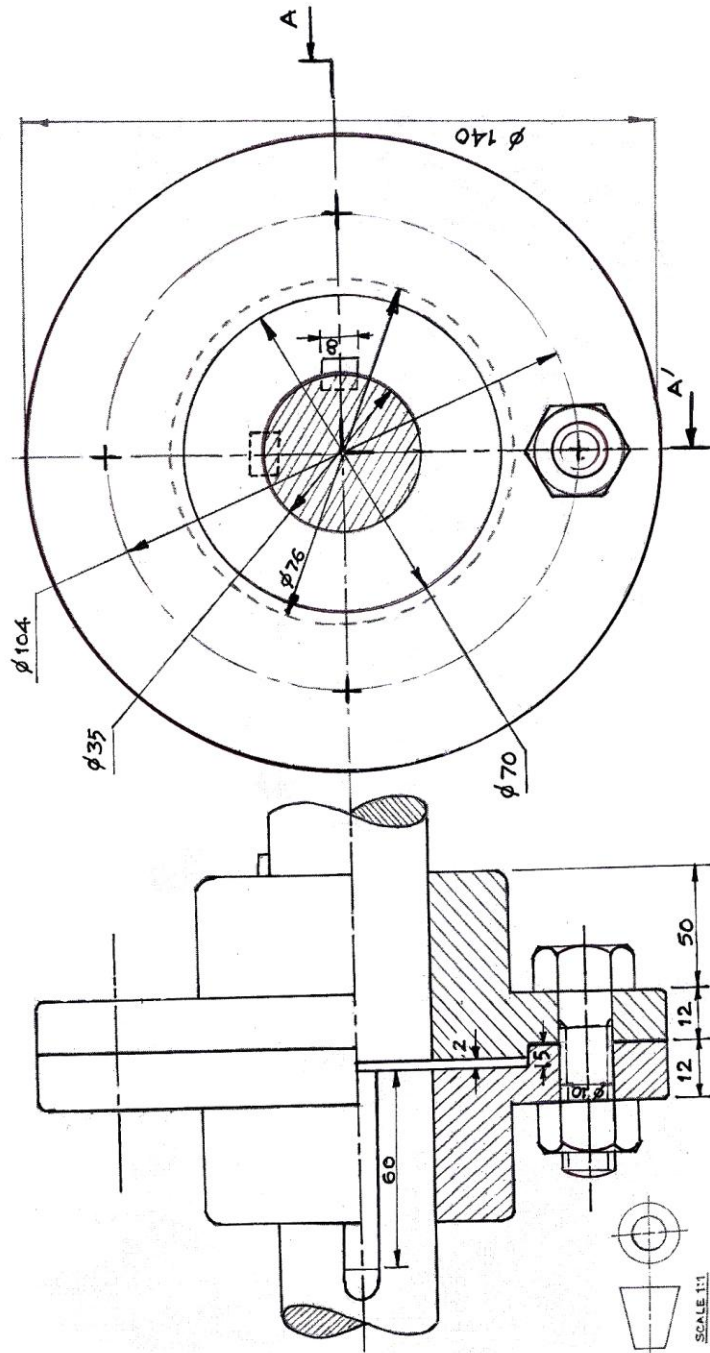
Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3).

Q 4 : **MULTIPLE CHOICE QUESTIONS** **5**

- | | |
|----------------------------|---|
| (i) (c) or 15°. | 1 |
| (ii) (b) or Stud. | 1 |
| (iii) (c) or Woodruff key. | 1 |
| (iv) (a) or Pin joint. | 1 |
| (v) (a) or Rim. | 1 |







SIDE VIEW (CL)

HALF SECTIONAL FRONT VIEW AT A-A'

UNPROTECTED FLANGE COUPLING

68

3

