CLASS XII
ENGINEERING GRAPHICS
MARKING SCHEME - SQP (046)
(2019-20)

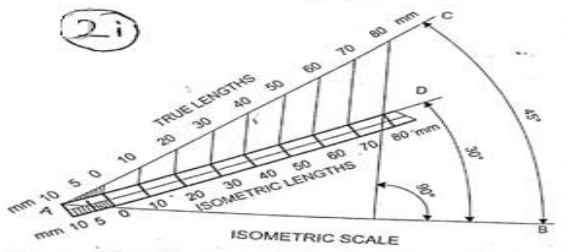
Maximum Marks: 70 Time: 3hrs

Q.1	M.C.Q. (i) c or 15^o (ii) a or Ellipse (iii) b or Stud (iv) a or Rim (v) d or 1:30	***5×1=5 Marks***
Q 2.(i)	ISOMETRIC SCALE	***4***
(a)	Marking of divisions of 10mm, including divisions of first part of 1mm on true length	1
(b)	Projections from scale 1:1 to get points on isometric scale, construction of isometric scale	2
(c)	Printing True Length / Scale 1:1, Isometric length/Isometric Scale and marking angles of 30^o& 45^o	1
(ii)	ISOMETRIC PROJECTION OF THE FRUSTUM OF A CONE	***7***
(a)	Drawing upper & lower isometric ellipses	3
(b)	Drawing both generators	$1\frac{1}{2}$
(c)	Marking vertical axis, central lines, direction of viewing	$1\frac{1}{2}$
(d)	Dimensions	1
(iii)	ISOMETRIC PROJECTION OF A SQUARE PYRAMID, PLACED CENTRALLY, ON A TRIANGULAR PRISM	13
	<u>TRIANGULAR PRISM</u>	
(a)	Drawing helping figure	1
(b)	Drawing both isometric triangles	$2\frac{1}{2}$
(c)	Drawing vertical edges	$1\frac{1}{2}$
(d)	Marking axis & direction of viewing	1
(e)	Dimensions	1
	<u>SQUARE PYRAMID</u>	
(a)	Drawing isometric square base	$2\frac{1}{2}$
(b)	Drawing slant edges	$1\frac{1}{2}$
(c)	Marking vertical axis & central lines at base	1
(d)	Dimensions	1
Q 3.(i)	<u>SINGLE RIVETED LAP JOINT</u>	**8**
(a)	Drawing plates of thickness ‘t’ with 10^o angle at end of plates	$2\frac{1}{2}$

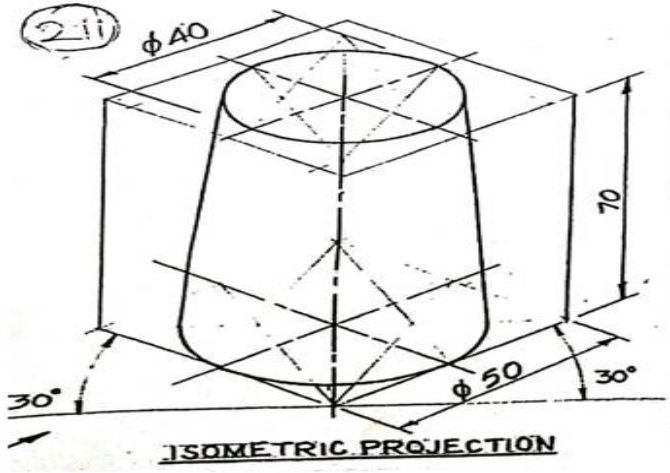
(b)	Drawing rivet heads	2
(c)	Drawing hatching lines	$1\frac{1}{2}$
(d)	Standard Dimensions	2
	Or	
	T- HEADED BOLT FRONT VIEW	***8***
(a)	Threaded and unthreaded portions of cylindrical shank	2
(b)	Head of bolt with square neck	2
	SIDE VIEW	
(a)	Rectangle with two horizontal lines	1
(b)	Two circles as per convention	1
(c)	Standard dimensions	2
(ii)	WOODRUFF KE	***5***
(a)	Front view	2
(b)	Top view	1
(c)	Side view	1
(d)	Standard dimensions	1
	Or	
	ROUND HEAD MACHINE SCREW	***5***
(a)	Drawing the front view	$2\frac{1}{2}$
(b)	Drawing the top view	$1\frac{1}{2}$
(c)	Standard dimensions	1
Q4.	UNPROTECTED FLANGE COUPLING (Assembly)	
(i)	FRONT VIEW (Lower half in section)	***14***
(a)	Flanges in lower half with extension 5mm & gap 2mm and hatching lines	5
(b)	Hexagonal nut & bolt in lower half	3
(c)	Rectangular keys & shafts with broken ends	3
(d)	Flanges in upper half	3
(ii)	SIDE VIEW (from left side)	***8***
(a)	Five circles including pitch circle diagram of ϕ104	$2\frac{1}{2}$
(b)	Hexagonal nut & bolt corresponding to front view	2
(c)	Keys	2
(d)	Hatching as per convention& cutting plane	$1\frac{1}{2}$
	Printing title(1), scale used (1), projection symbol (1) and six dimensions(3)	***6***
	Or	
	TURN BUCKLE (Disassembly)	
(a)	Turn Buckle	***15***

	Front view (full in section)	
(i)	Outline of body with conical ends and hatching lines	6
(ii)	space for rods with internal threads	3
	Top View	
(i)	Outline of body with conical ends and correct vertical and horizontal lines.	4
(ii)	Hidden lines for internal threads and space for rods	2
(b)	Rod B	***7***
	Front View	
(i)	Rod with conventional broken end and threads as per convention	5
	Side View	
(i)	two circles as per conventions	2
	Printing titles of both (1), scale used (1), drawing projection symbol (1) and six dimensions (3)	***6***

2i

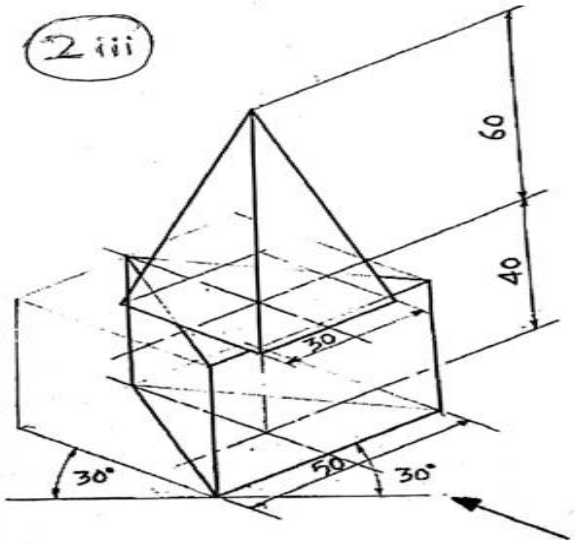


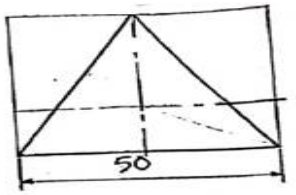
2ii



ISOMETRIC PROJECTION

2iii



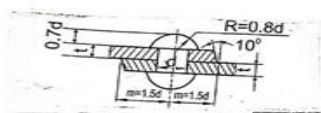


HELPING VIEW

ISOMETRIC PROJECTION

COMBINATION

3 i

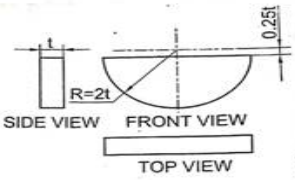


FRONT VIEW IN SECTION

SINGLE RIVETED LAP JOINT

t	$d = 6\sqrt{t}$	0.7d	0.8d	p = 3d	m = 1.5 d
16.0	24.0	16.8	19.2	72.0	36.0

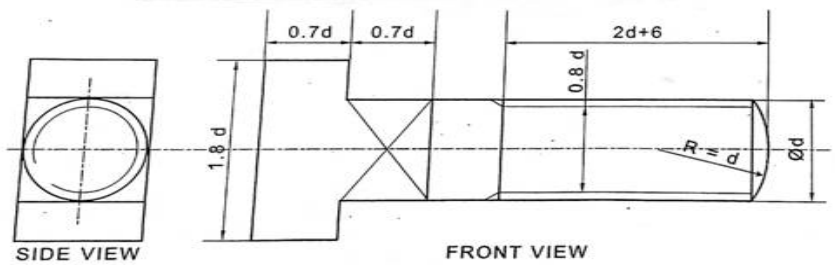
3 ii



WOODRUFF KEY

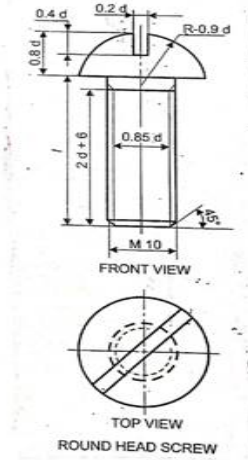
d	60
t	10
0.25t	2.5
0.5t	5
2t	20

OR



d	0.7d	0.85d	1.8d
20	14	17	36

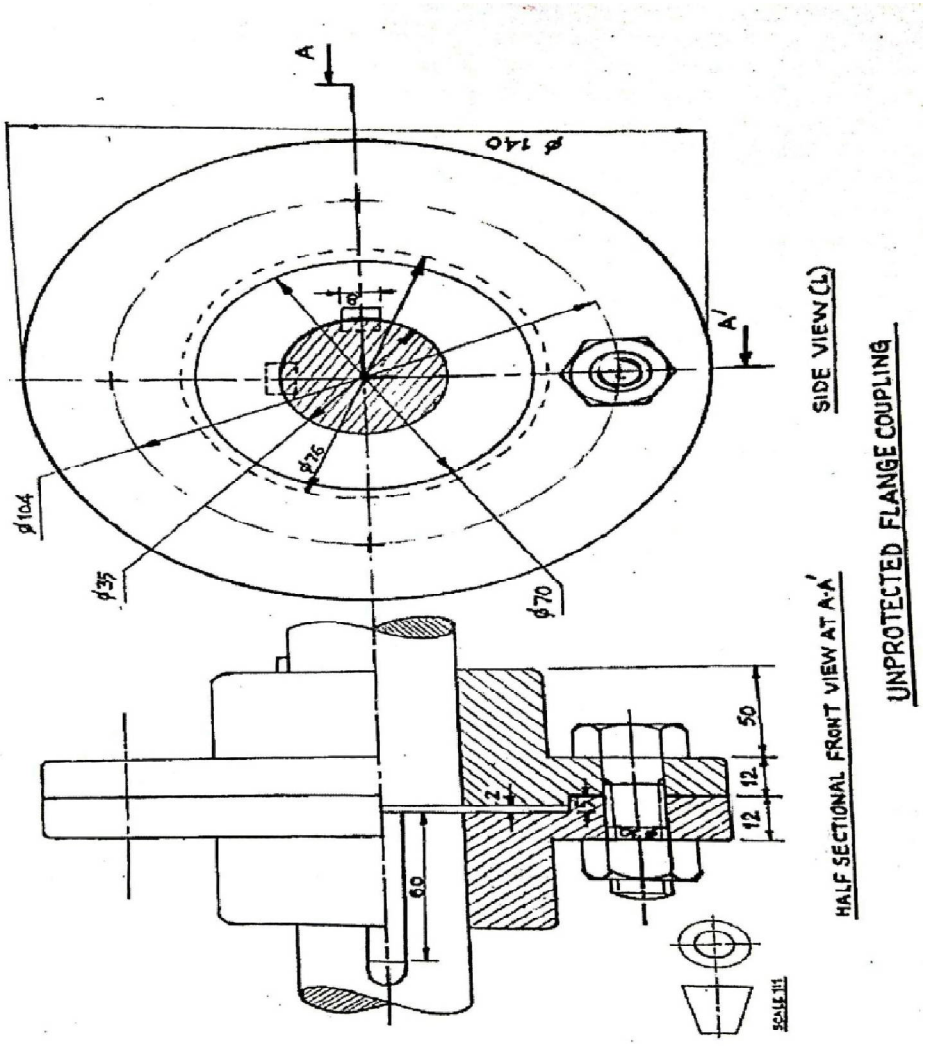
T-HEADED BOLT



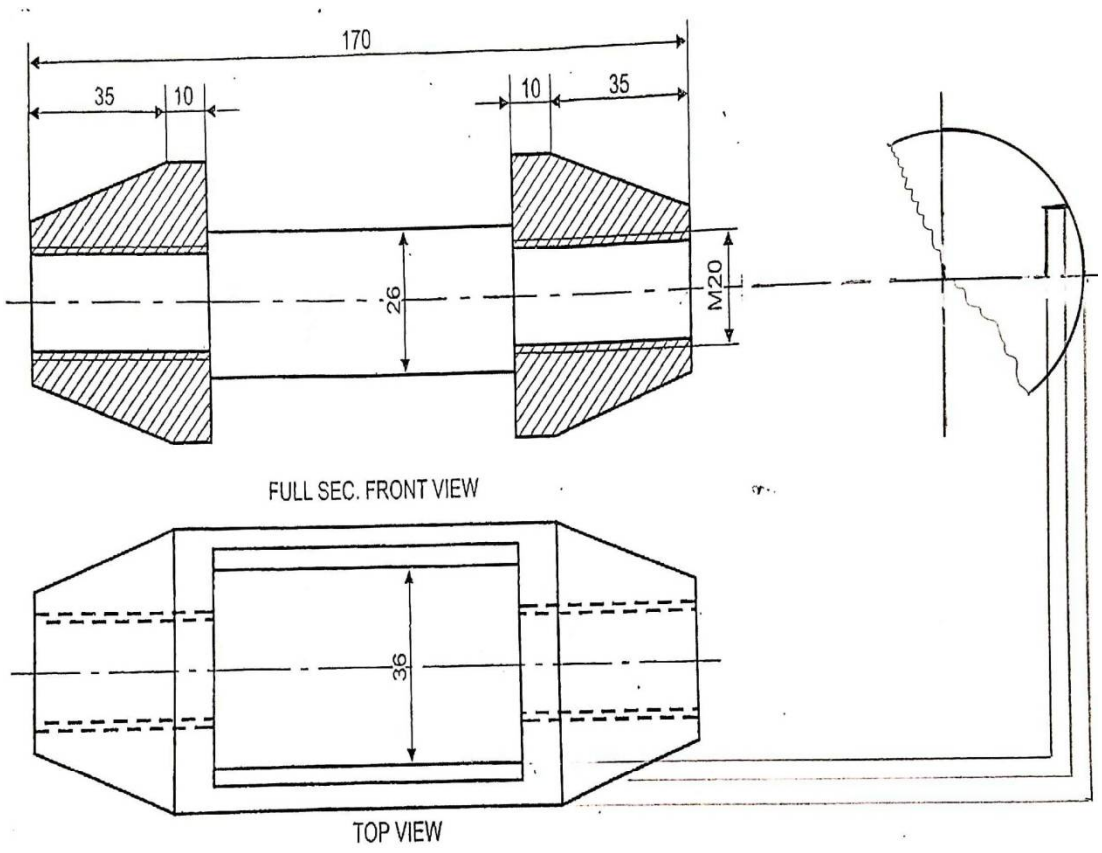
ROUND HEAD SCREW

d	20
0.2d	4.0
0.4d	8.0
0.8d	16
0.85d	17
0.9d	18
2d+6	46

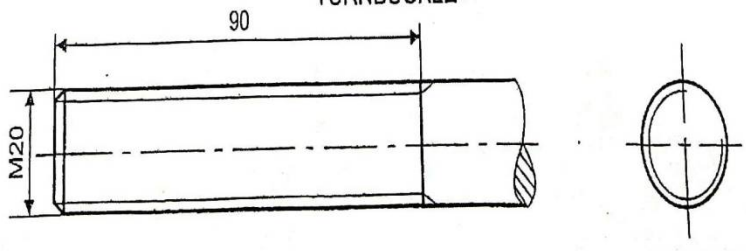
(4)


A
A'
ϕ 140
ϕ104
ϕ35
ϕ76
ϕ70
SIDE VIEW (L)
HALF SECTIONAL FRONT VIEW AT A-A'
UNPROTECTED FLANGE COUPLING
50
12
12
2
5
60
SCALE 1:1

OR



TURNBUCKLE



ROD-B

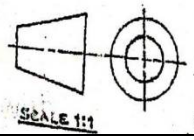


Fig. 6.8 DISASSEMBLY OF TURNBUCKLE