5.7 DRAWING AND DESIGN (449)

### 5.7.1 Drawing and Design Paper 1 (449/1)

1. (a)	**Qualities of an entrepreneur** – Ability to pursue self-employment – Ability to identify business opportunities – Ability to mobilize or solicit for funds or resources – Ability to solve problems – Is a risk taker. – Is creative – Is an innovator – Is a good manager of time **(Any 3 x 1= 3 marks)**		**(3 marks)**
(b)	**Characteristics of a good technical drawing paper** – The texture should be smooth – The colour should be white for contrast – The thickness should be adequate so that the pencil does not penetrate through (should not tear easily) – The surface finish should not be glossy to cause reflection. – Should be standard sizes **(Any 4 x ½= 2 marks)**		**(2 marks)**
2. (a)	**Two instruments for drawing vertical lines** – T – square – Set - square **(Any 2 x ½= 1 mark)**		**(1 mark)**
(b)	**Use of dividers** – Transferring measurements from the ruler to the drawing or from one drawing to another – Stepping off a series of equal distances. **(Any 2 x1= 2 marks)**		**(2 marks)**
3.	**Types of lines** A - Outline – used to show visible outline and edges B – Centre line – used to show centre lines for circles or lines of symmetry C – Hidden detail lines – used to show features which are hidden from viewer. D – Cutting plane line – indicates where the cutting plane is E – Break line – indicates the limit of partial views as sections F – Hatching lines – it is used to show the part which has been cut **6 x ½= 3 marks)**		**(3 marks)**

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|			
4.	(a)	**Classifications of metals** Ferrous metals e.g. steel, iron Non-ferrous metals e.g. copper, aluminium, silver, gold Alloys e.g. brass, bronze **Naming 3 x½= 1½marks** **Examples3 x½= 1½marks**	**(3 marks)**
	(b)	Drawing the circles 80mm apart - ½ mark Bisecting 80mm distance - ½ mark Drawing semi-circle - ½mark Drawing arc radius $R_1 + R_2$ = **½ mark** Drawing // lines – ½ mark Drawing the tangent – ½ mark = 3 marks 	**(3 marks)**

5. (a)
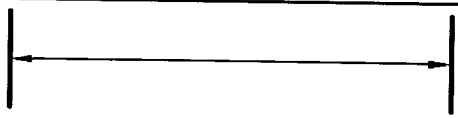
Linear dimensions

Angular dimensions
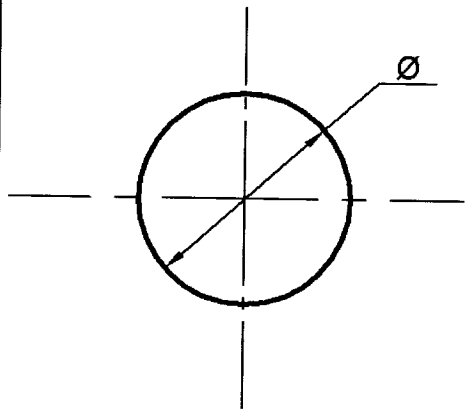
Circular dimensions

Ø

(3x 1= 3 marks)

(3 marks)

(b)

$$\text{Length of scale} = \frac{30}{1000} \times (4 \times 1000) = 120\text{mm}$$

Determining the length of scale - ½ mark
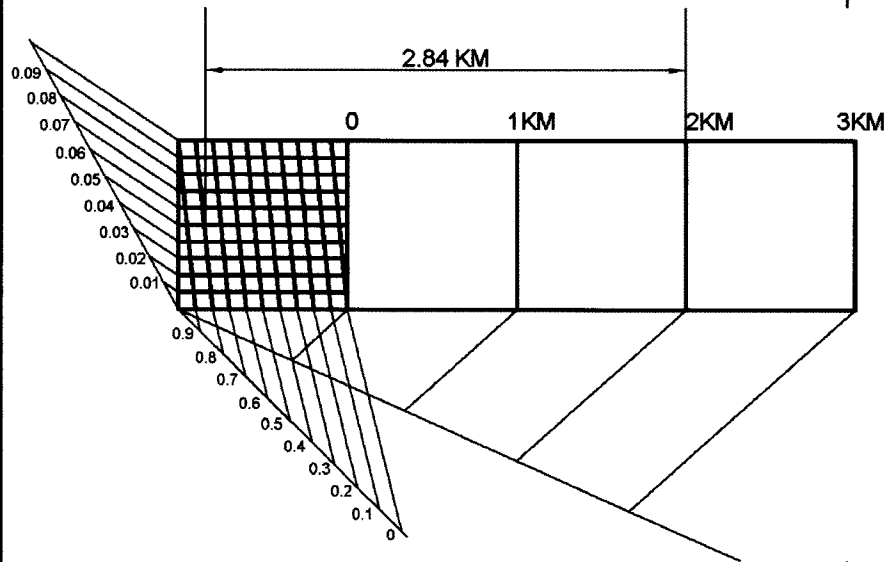
Division of 120mm into 4 divisions - ½ mark

Division of 1st part into 10 divisions – **1 mark**

Division of vertical part into 10 divisions – **1 mark**
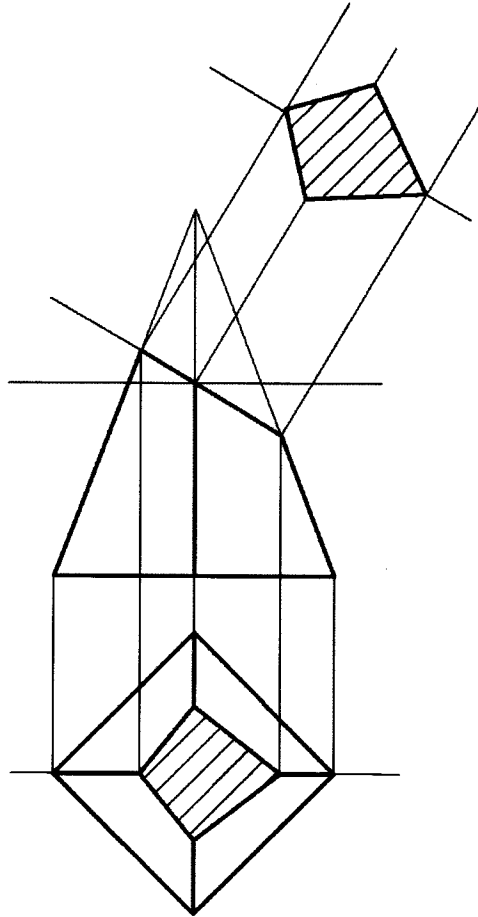
Drawing the diagonals – **1 mark**

Showing the reading of 2.84 km – 1 mark
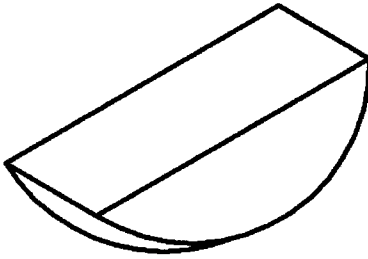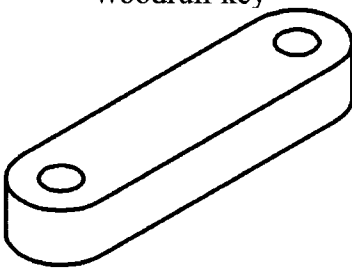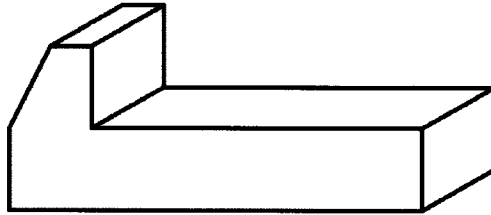
= 5 marks

(5 marks)

6.

Correct projections- 1 mark
Correct plan – 1 mark
Hatching correctly – 1 mark
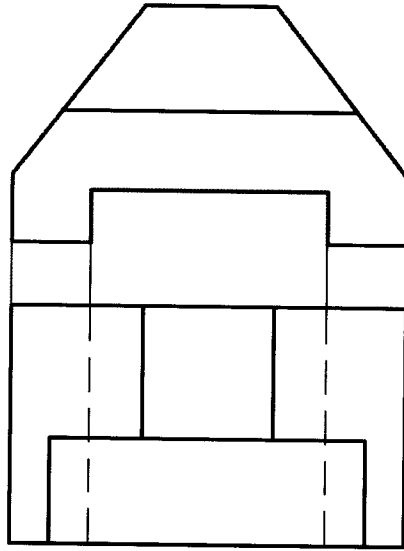Correct projection – 1 mark
Correct thrue shape – 1mark
= 5 marks

(5 marks)

7. (a)			

7. (a)

Woodruff key

Feather key

Gib head key

(2x3= 6 marks)   (6 marks)

8. **Diagrams for drawing**

- Archi – cad
- Auto – cad
- Paint
- Corel draw
- Sketch up
- Real draw

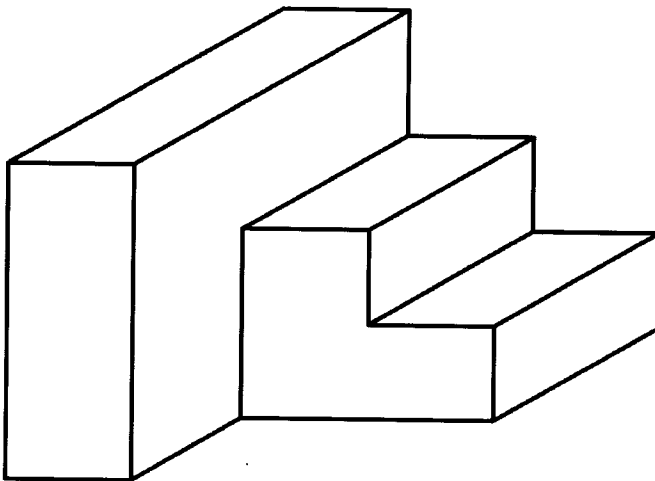(**Any 6x ½ mark= 3 marks**)   (**3 marks**)

| 9. |

F – Elevation
    -   2 faces @1 = 2
PLAN
    -   4 faces @ ½ = 2
H/Details 2 @ ½ = 1
Neatness   = 1
            = 6 marks | **(6 marks)** |
| 10 |

Correct oblique projection - ½ mark
8 faces represented correctly 8x ½ =4 marks
Line work ½ mark
        = 5 marks | **(5 marks)** |

11.
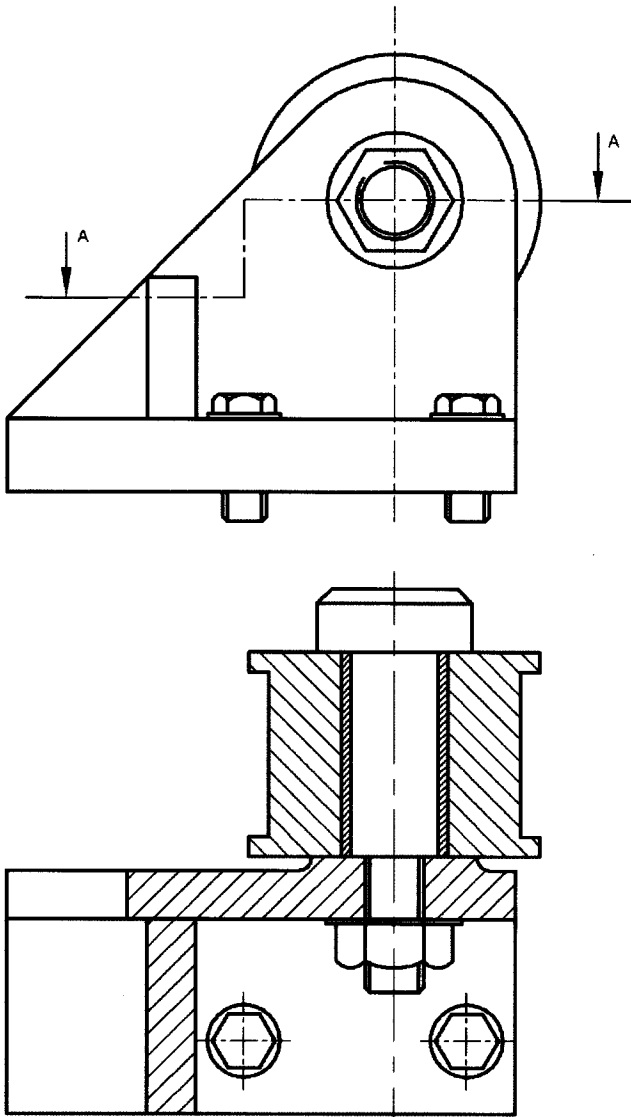
SECTIONAL PLAN A-A

F. ELEVATION
- 5 parts assembled @ 1 = 5 marks
- 3 bolt drawn @ 1 = 3 marks
- 3 centre lines = ½ mark

PLAN
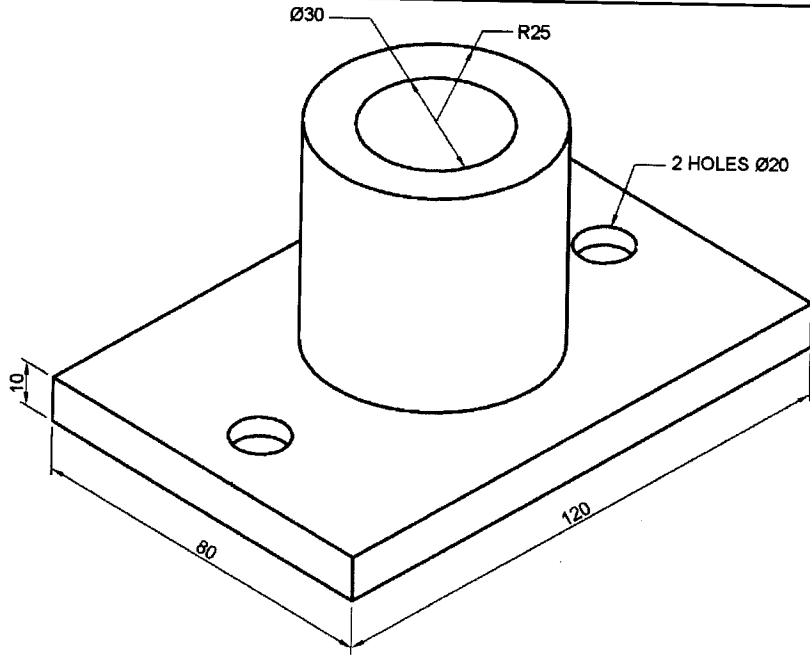- Any 5 Parts shown @ 1 = 5
- Nut and pin not hatched 2x1=2

- Correct angle of projection=1 mark
- 3 Parts hatched @ 1 = 3 marks
- Line work = ½ mark
         = 20 marks

(20 marks)

12.

Ø30 — R25

2 HOLES Ø20

10

120

80

Isometric projection – 1 mark
Correct main faces – 3 marks
Construction of isometric circles – 5marks
Correct position of point X- 1 mark
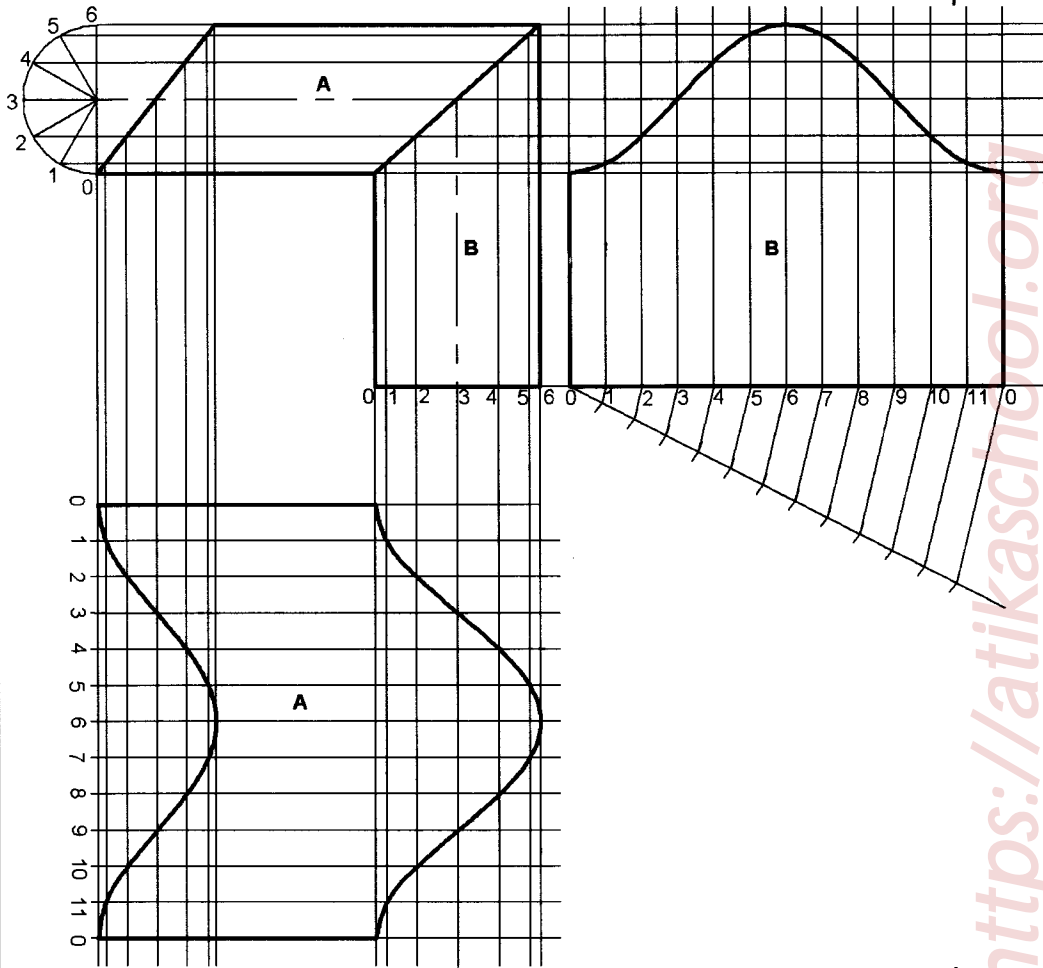Neatness and line work – 2 marks

6 Correct dimensions @ $^1/_2$ - 3 marks

1   Total   15 marks

(15 marks)

13.

Copying of figures – 1
Drawing circle and dividing into 12 divisions– 1
Correct Vertical Projections – 1
Correct Horizontal - 1

Part A and B
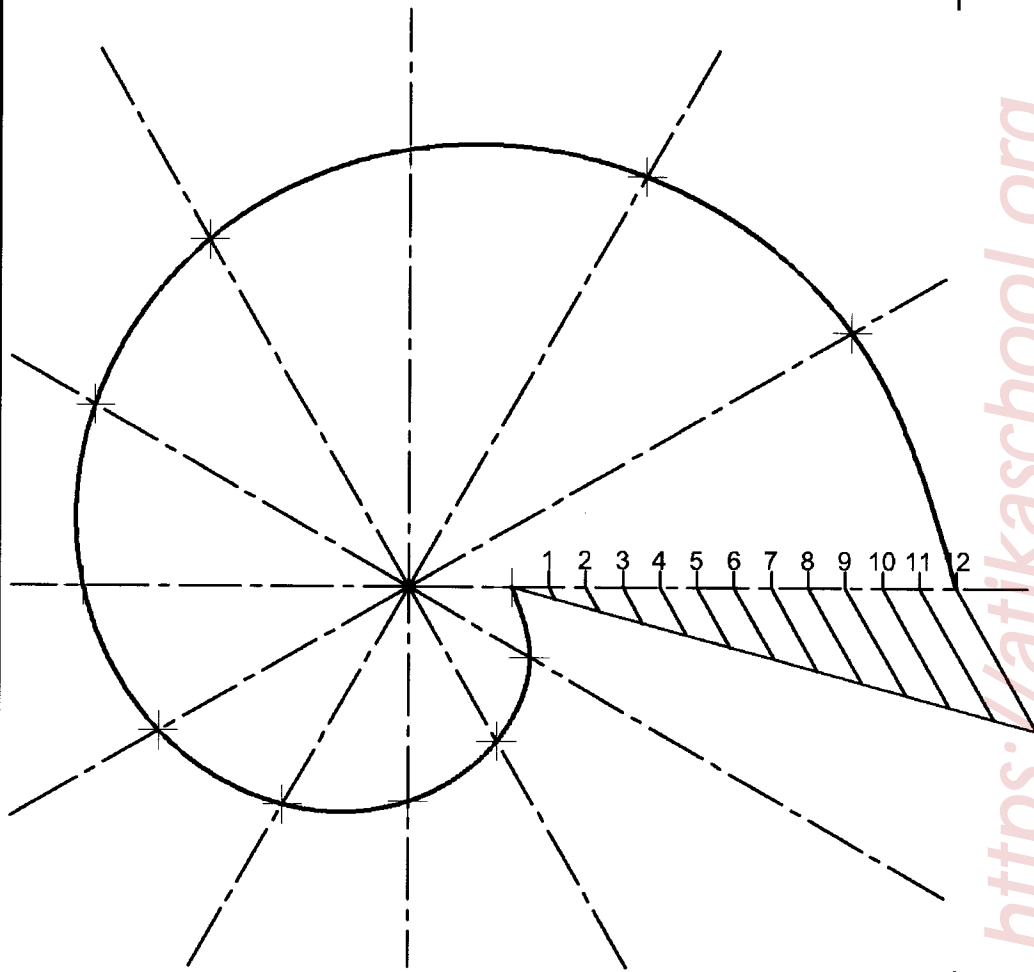
• Determining circumference 2x1 =2
• Dividing circumference into 12 parts 2x1=2
• Vertical projections 2x1 =2
• Horizontal projections 2x1=2
• Plotting of points 2x ½ =1
• Joining the points 2x1=2

Total =15 marks

(15 marks)

14.

Drawing line OB & OA – 1

Drawing circle radius OB – 2

Division of AB into 12 = 2

Division of circle into 12 = 2

Drawing arcs from 1-11 = 3

Joining the points to form the spiral = 3

Line work and neatness = 2

15 marks

(15 marks)