



## 5.7 DRAWING AND DESIGN (449)

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

#### SECTION A

1. (a) Information regarding parastatal organizations in Kenya:
- (i) Ownership  
They are largely owned by the government.
  - (ii) Management  
They are managed by government appointees.
  - (iii) Services  
They provide subsidized services to the customers who might find it expensive to afford them if they were left to private establishments.
- (3 x 1 = 3 marks)**
- (b) Steps involved in the design process:
- (i) Statement/stating the problem.
  - (ii) Recording the design ideas in form of sketches and written notes.
  - (iii) Selecting the best solution.
  - (iv) Preparing the final drawing or mock-up (model).
- (4 x 1 = 4 marks)**
- 2 (a) (i) Reasons for using different types of lines in drawing:
- It makes the drawings neat and legible.
  - It makes it easy for the person/people depending on the drawing to interpret the details in the drawing.
- (1 x 1 = 1 mark)**
- (ii) Use of the following lines:
-  centre line denoting:
    - centre of a circle
    - axis of symmetry
  -  phantom to denote:
    - folding line
    - different possible positions
- (2 x  $\frac{1}{2}$  = 1 mark)**
- (b) Advantages of using computers in drawing:
- (i) There is higher speed in production of drawings thus saving time.
  - (ii) There is high degree of accuracy.
  - (iii) It is easy to retrieve information.
  - (iv) It is easier to make alterations on the drawings.
  - (v) It allows for interfacing/interlinking.
  - (vi) It allows for production of many copies.

(iii) The drawings produced are neat.

(Any 6x  $\frac{1}{2}$  = 3 marks)

ii Disadvantages of using:

- ti Masking tape to hold paper
  - it tends to peel off part of the paper
- iu Thumb pins to hold paper
  - they ruin the surface of the drawing board

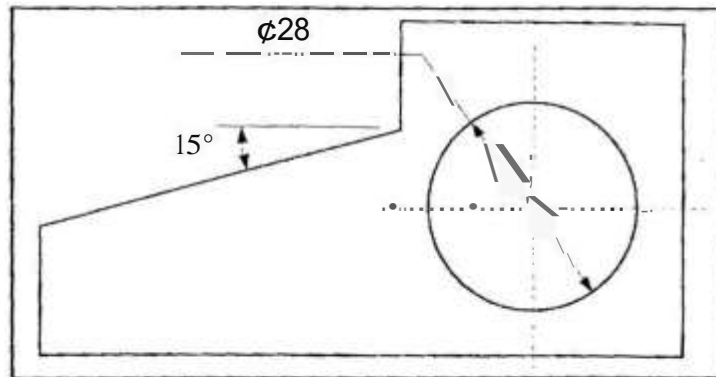
(2x1=2marks)

- b) (i) Plywood are manufactured boards made of thin sheets of wood (veneers) that are glued together with the grain of each layer perpendicular to the next.
- (ii) Chipboard is manufactured by chips of wood which are compressed and glued to the required density.
- (iii) Blockboards are made up of blocks of timber joined on edge and faced suitably with plywood on both faces.

Sketches to be accepted.

(3x1=3 marks)

4.

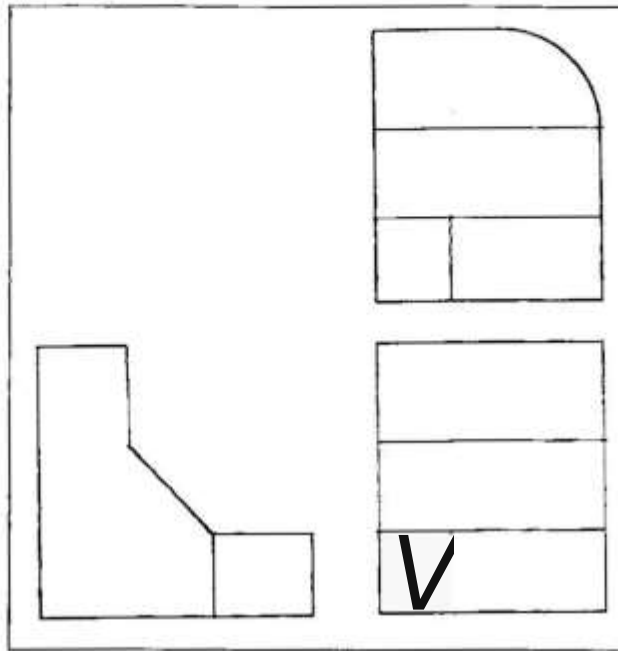


Figure

Correct  $\phi 28$  -  $\frac{1}{2}$  mark  
Correct  $15^\circ$  -  $\frac{1}{2}$  mark  
Correct arrow for  $\phi 28$  -  $\frac{1}{2}$  mark  
Correct arrows for  $15^\circ$  -  $\frac{1}{2}$  mark

(2 marks)

5.

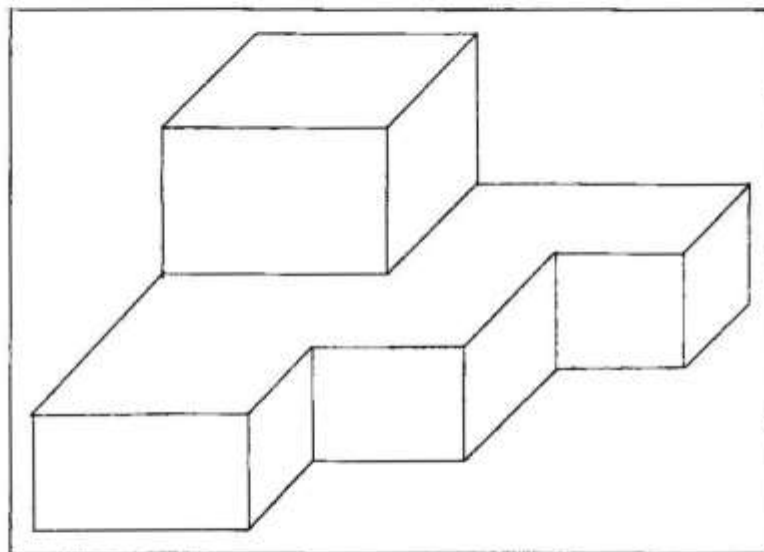


Figure

Plan - 4 faces @ } =2  
End elevation - 2 faces @ } = 1  
Front elevation - 4 faces @ } =2  
3 angle projection = 1 mark

(6 marks)

6.

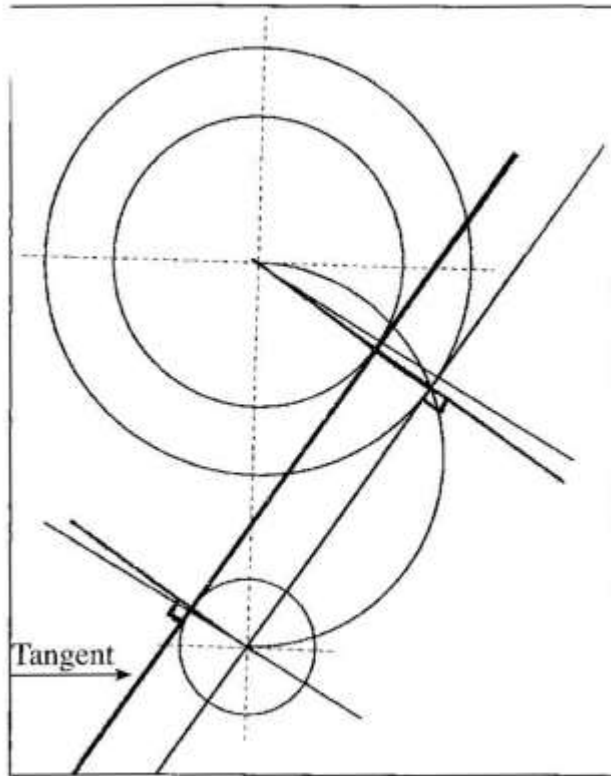


Figure

Oblique projection - 1 mark  
At least 9 faced 9/3-3 marks  
Proportionality - 1 mark  
Line mark - 1 mark

(6 marks)

7.



Figure

Construction of:

Correct circle radius

$R_1 + R_2$  - 2 marks

semi-circle - 2 marks

parallel lines - 2 marks

tangent (shown correctly) - 1 mark

(7 marks)

5.  $AB = \text{measured dimension} \times 2$        $60 \times 2 = 120\text{mm}$        $\frac{1}{2}$

$CD = \text{measured dimension} \times \frac{1}{2}$        $34 \times \frac{1}{2} = 17\text{mm}$        $\frac{1}{2}$

3 marks

OR

Correct measurements of AB and CD

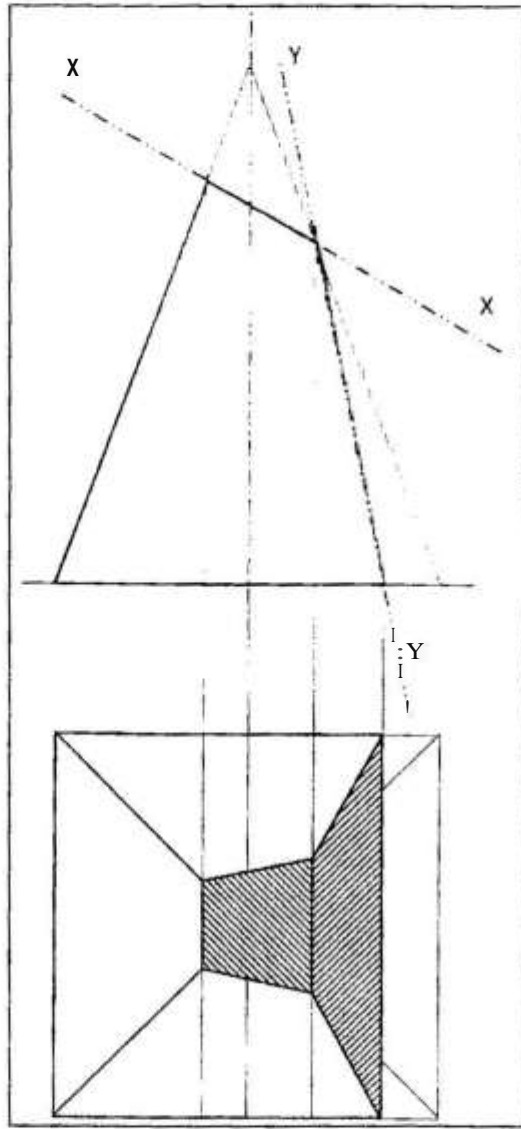
Determining the distances

$(2 \times \frac{1}{2} = 1 \text{ mark})$

$(2 \times 1 = 2 \text{ marks})$

3 marks

9.



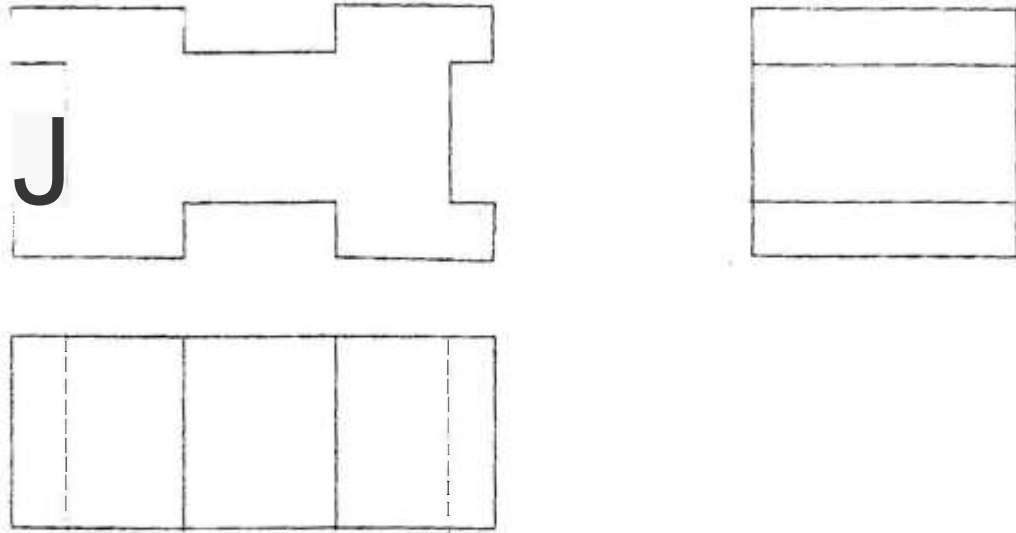
Figure

$$5 \text{ faces} \times \frac{1}{2} = 2\frac{1}{2}$$

$$\text{Hatching}(\underline{25})=1$$

Line work=};-

1€



Figure

Vertical projection lines - 1 mark  
Projection lines at 45° -1 mark  
*or by use of compass*  
correct outline -2 marks  
hidden details - 1 mark

(5 marks)

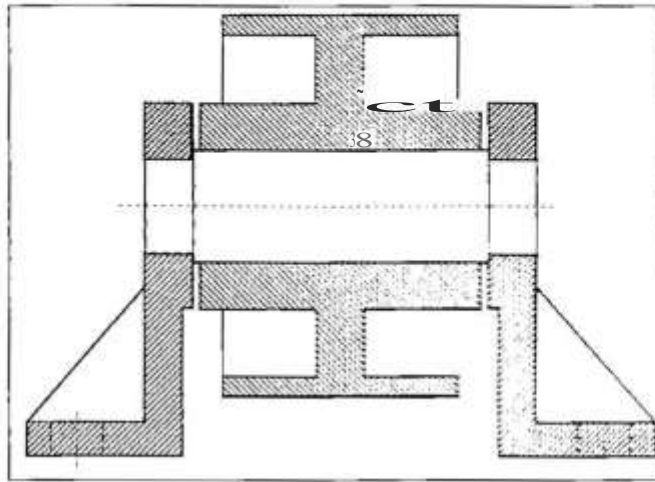
11.

Section FF

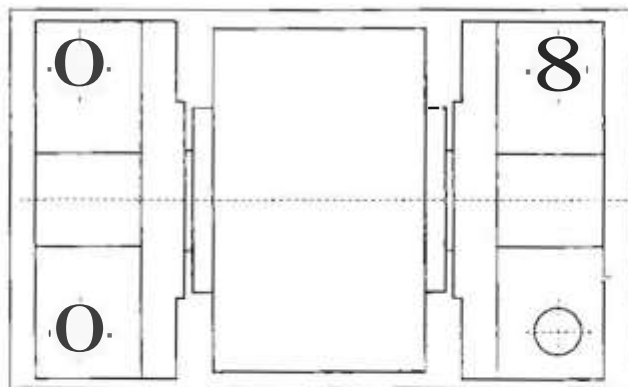
16 faces @  $\frac{1}{2}$  = 4 marks  
Hatching 6x1 = 6 marks  
Plan  
13 faces @  $\frac{1}{2}$  = 6  $\frac{1}{2}$   
4 holes @  $\frac{1}{2}$  = 2  
linework = 15

**20 marks**

11.

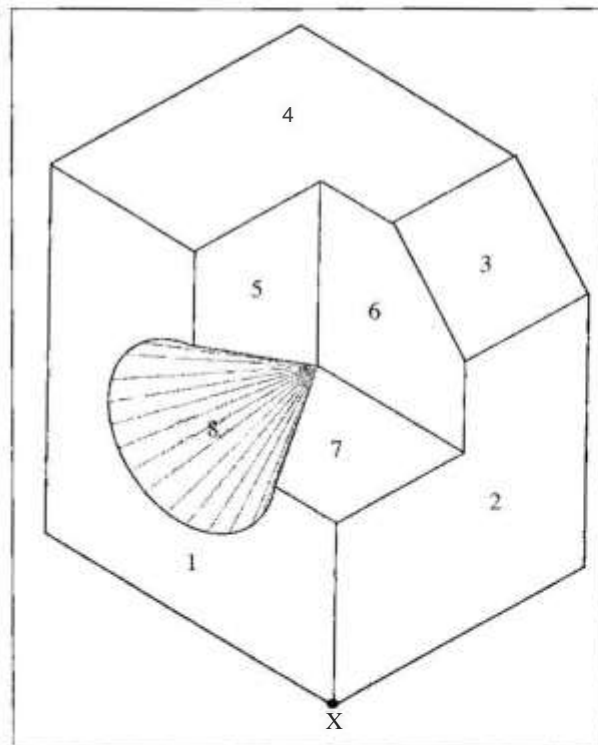


SECTIONAL FRONT ELEVATION ALONG F-F

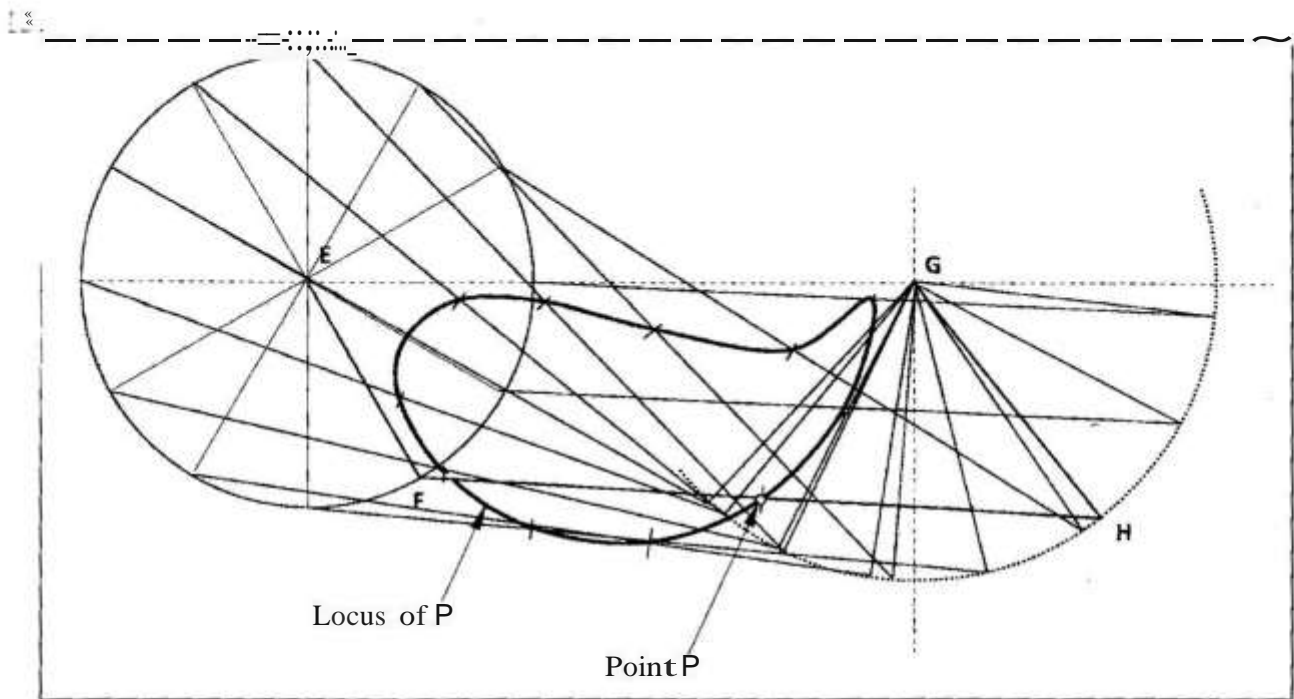


PLAN Figure

12.



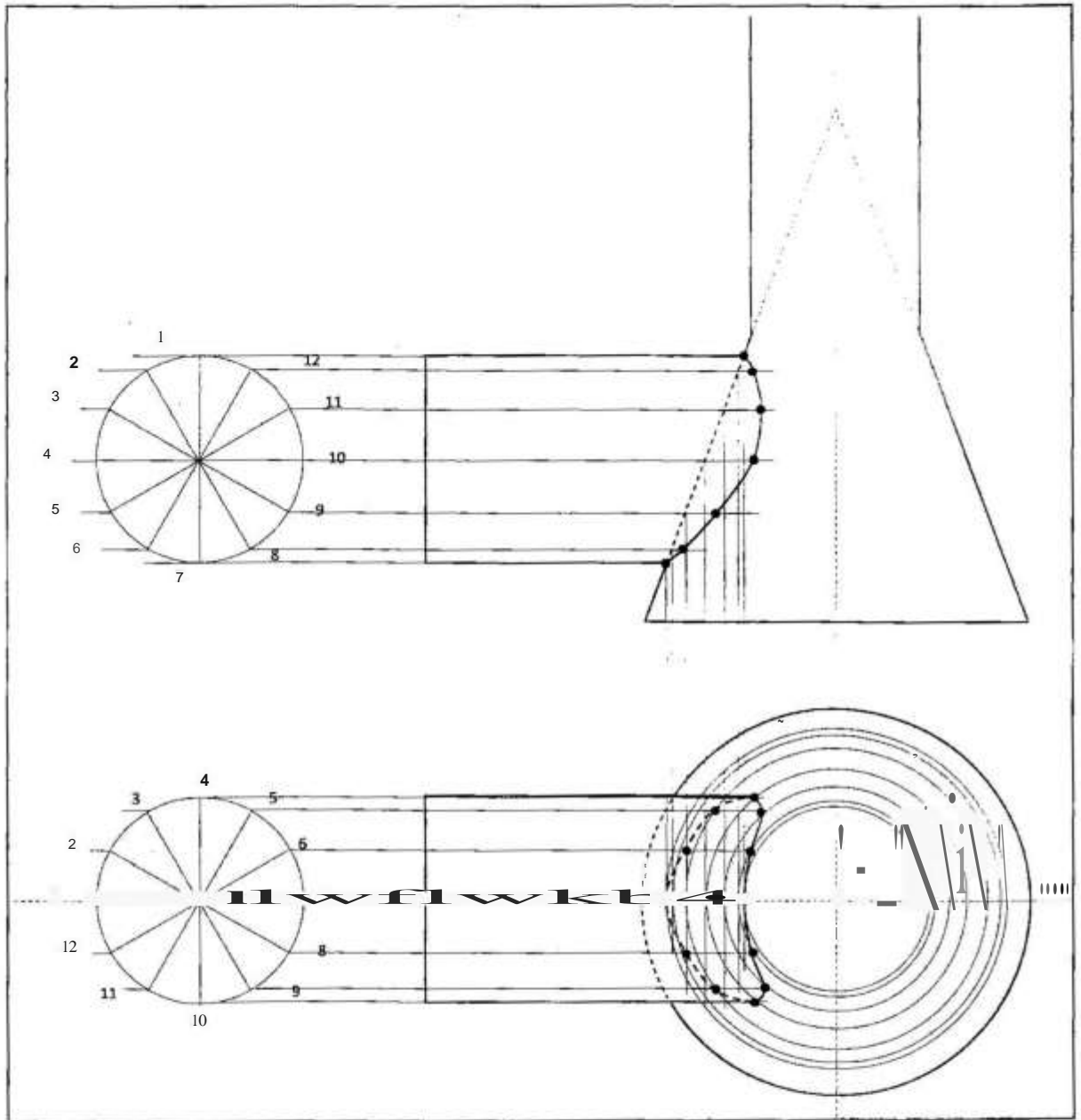
faces  $7 \times 1 = 7$   
 isometric axis = 1  
 low pitch  $X = 1$   
 pictorial curve = 2  
 conical hole (8) = 2  
 scale = I  
 linework = 1  
 (15 marks)



copying the figure (4x,.)=2  
 locus of F = 1  
 division of locus F = 2  
 locus of H = 1  
 projection to H=3  
 mid-point P = 3  
 completing locus of P=2  
 linework = 1  
 (15 marks)



14.

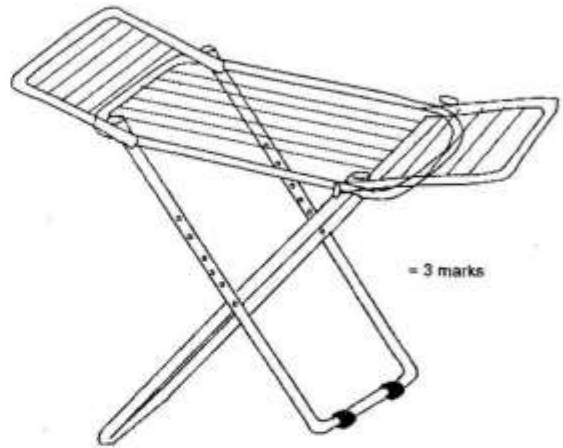
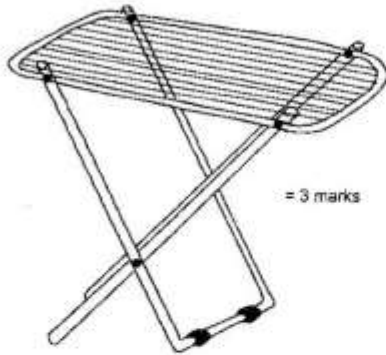


- drawn elevation = 1
- drawn plan = 2
- divide pipe in elevation = 1
- plot points at intersection of sloping edges = 1
- project elevation points to plan = 1
- draw circles at intersection of plan points and elevation points = 1
- mark curve of interpenetration points of plan = 2
- mark points of interpenetration on elevation = 2
- draw smooth curve through points of plan;  
part full lines; part hidden details = 1
- draw smooth curve through points of elevation = 1
- construct lines = 1
- outlines = 1

(15 marks)

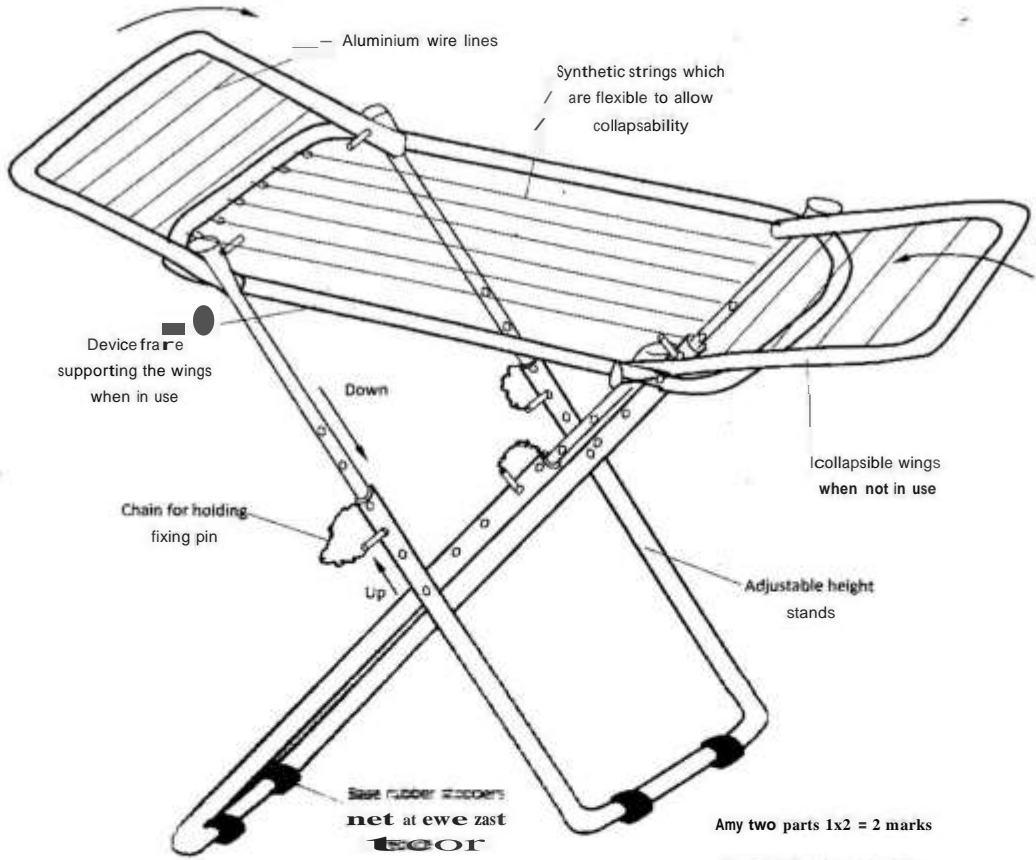
4.20.2 Drawing and Design Paper 2 (449/2)

a)



Total = 6 marks

b)



Any two parts 1x2 = 2 marks

Pictorial sketch = 14 marks

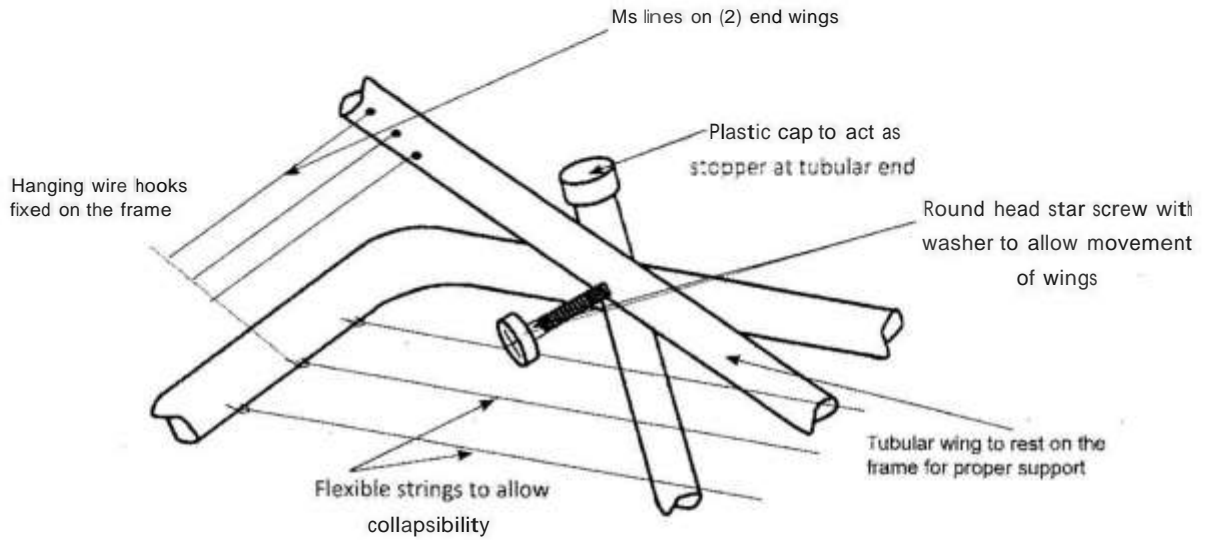
**Total = 16 marks**

(c)

Consideration i

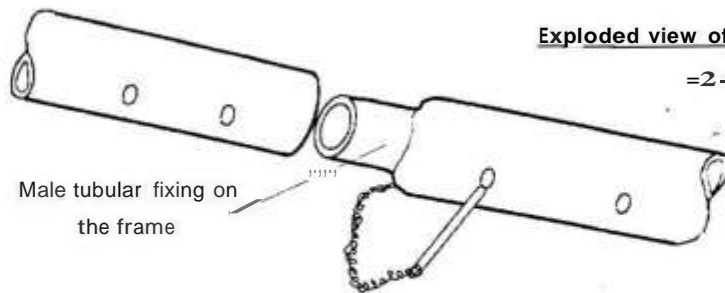
**Collapsible wings**

= 4 marks



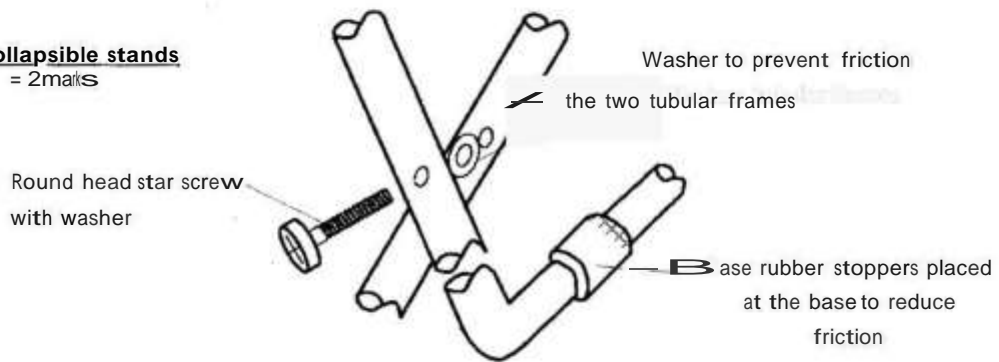
**Exploded view of Collapsible side frame**

= 2-2rs



**Collapsible stands**

= 2 marks

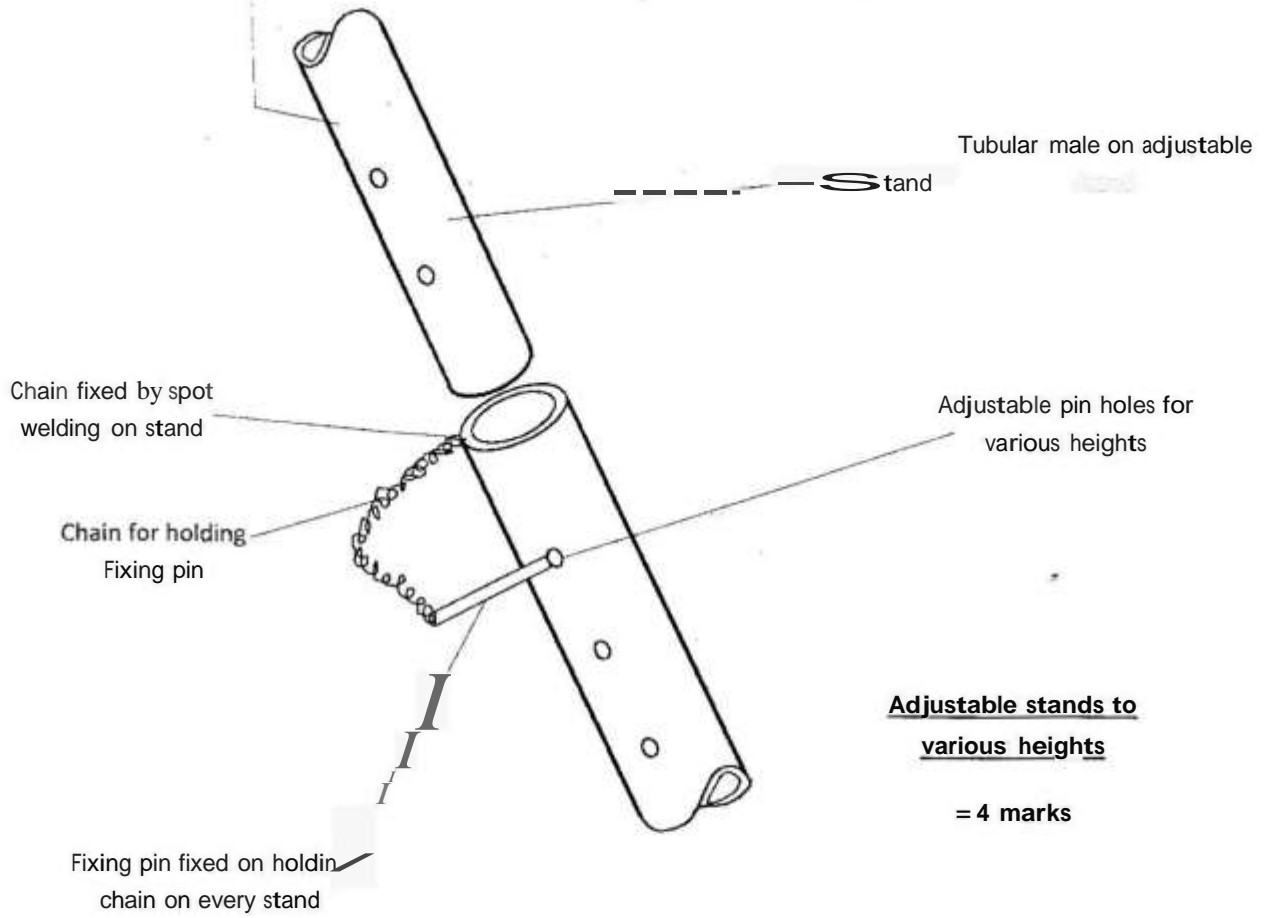


sub total = 8 marks

Consideration iii

Exploded

Adjustable stands to different heights



**Adjustable stands to various heights**

**= 4 marks**

Total 8+ 4 = 12 marks

d) MATERIALS USED

- (i) • Aluminium tubular (1 mark)
- Rubber Stoppers (1 mark)

(ii) CHOICE OF MATERIAL

- Aluminium tubular: - light in weight for easy movement. # mark
- Rubber stoppers: Anti-slip material to reduce friction on the ground when device is at work. (1 mark)

3 marks

(e) (i) TWO JOINING METHODS

- Riveting (1 mark)
- Glueing (1 mark)

(ii) WHERE APPLIED

- Riveting: - At the stands joints and collapsible wing joints. 1 mark
- Glueing:- Fixing Rubber stoppers with strong adhesive to the stand base frame when device is at work. (1 mark)

3 marks

**Total = 40 marks**