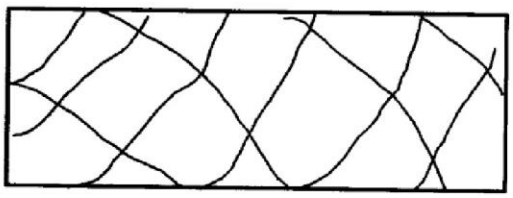
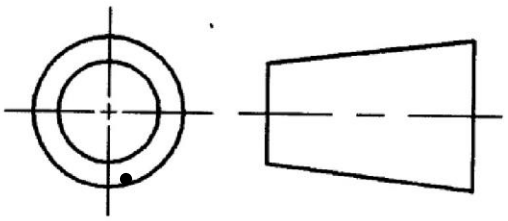
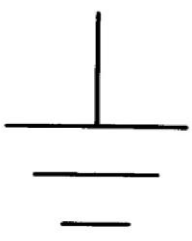
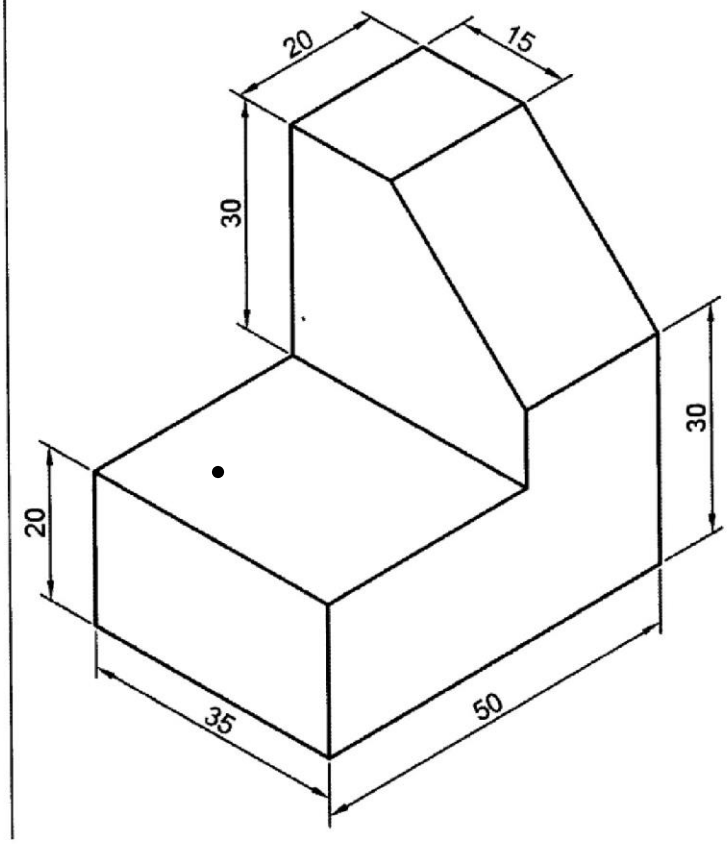
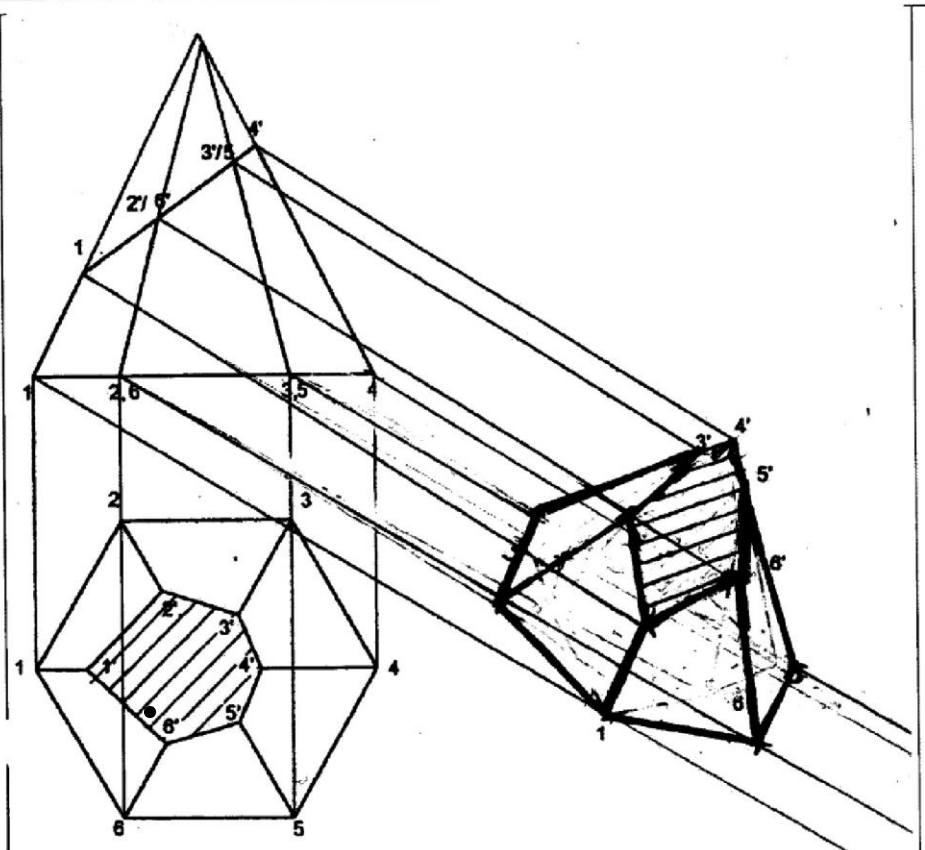
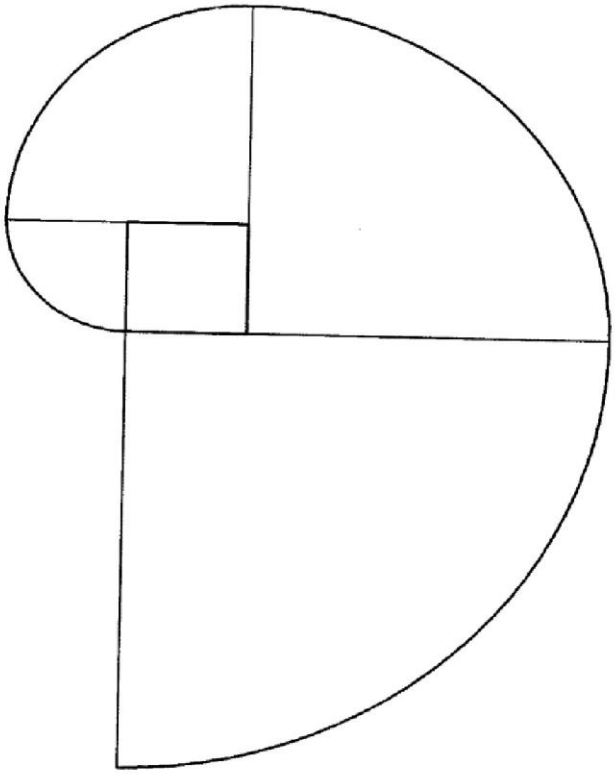
4.22 DRAWING AND DESIGN (449)

4.22.1 Drawing and Design Paper 1 (449/1)

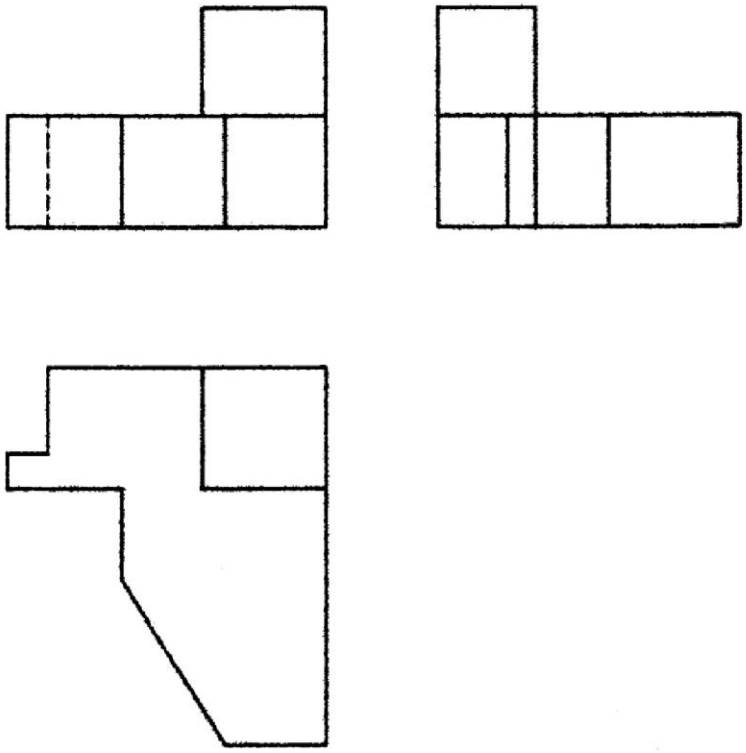
1. (a)	**Roles of 'NITA'** (i) Controls training of personnel in the industry. (ii) Offers technical training in various institutions. (iii) Examines and certifies various technical trades. (iv) Controls the type of examinations and certificates to be awarded for Artisan Courses in Kenya. (v) Gives guidance on the scope of training in the technical fields.	Any 3 x 1 = 3 marks
(b)	Sharpening pencil leads: (i) Chisel → used with a compass for drawing arcs and circles. Used for drawing of construction lines and guidelines (ii) Pointed /conical → for general purpose e.g. lettering and outlines.	(2 x 1) = 2 marks
2. (a)	Symbols for:- (i) Plan timber  (ii) Third angle projection  (iii) Earth Wire 	(3 x 1 = 3 marks)

3. (a)	**Advantages of plywood over solid timber** • It is stronger. • It can be shaped by folding into intricate shapes. • It is available in large sheets. • Does not require planning • Does not split if nailing is done at the edges. Any 2 x 1=	2 marks
(b)	Factors that relate to good or bad design with regard to: **(i) Material** • Availability • Workability • Cost • Suitability • Safety • durability **(ii) Proportion** • Aesthetics • Application • Use-ability • Ergonomics Any 2x1/2x1=	2 marks
4.	Drawing with the correct dimensions = 1 mark Any 6 dimensions 6x1/2=3 marks  	**4 marks**

5. (a)	**Reasons for care when storing drawing instruments.** • To preserve their accuracy. • To avoid breakages that may be occur. • For durability thus reducing the cost of replacement. • To prevent deformation	(Any 2 x ½ = 1 mark)
(b)	**Components of a computer** • Monitor – Displays information to the user. • CPU – It is the central processing unit where processing of data and information takes place. • Mouse – It is used for selecting, pointing, and highlighting. • Keyboard – It is used for capturing and entering numeric and alphabetical commands.	• 4 components 4 x ½ = 2 marks • Correct use of each component stated 4 x ½ = 2 marks **4 marks**
6.		Copying the front elevation - ½ mk Construction of plan correctly – 1 mk Projection from the front elevation - ½ mk Correct centre line for Auxiliary view - ½ mk Transfer of points from plan - ½ mk Joining points for upper part – 1 mk Joining points for the base – 1 mk Completion of Auxiliary view – 2 mks **7 marks**

7.		**M/S.** • Drawing the square – 1 • Drawing the 4 radii – 4 x ½ = 2 • Drawing the 4 quadrants – 4 x ½ = 2 **5 marks**
8. (a)	The accuracy of the scale is 0.01 m (1cm)	1
(b)	Reading 'P' - Main reading 1.50m	1
	- 1 Horizontal Div. represents $\frac{0.5}{10} = 0.05$m	
	3 Horizontal Divisions = 0.05 x 3 = 0.15m	1
	- 1 Vertical Divisions = $\frac{0.05}{5} = 0.01$	
	3 Vertical Divisions = 3 x 0.01 = 0.03	1
	Total reading = (1.50 + 0.15 }+0.03) = 1.68m	1 **5 marks**

9.



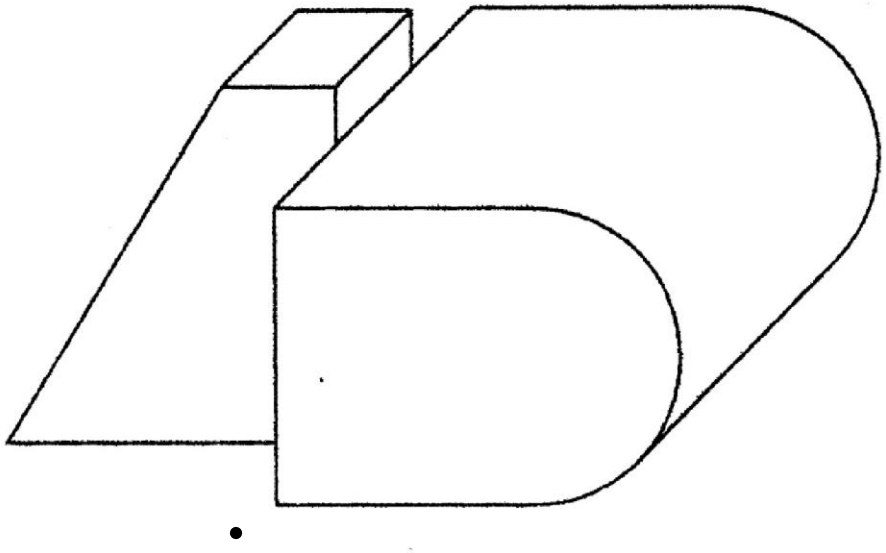
M/S.
F/Elevation
4 faces @ ½ = 2
I H/Detail @ ½ = ½

PLAN
2 faces @ ½ = 1

E/Elevation
5 faces @ ½ = 2½

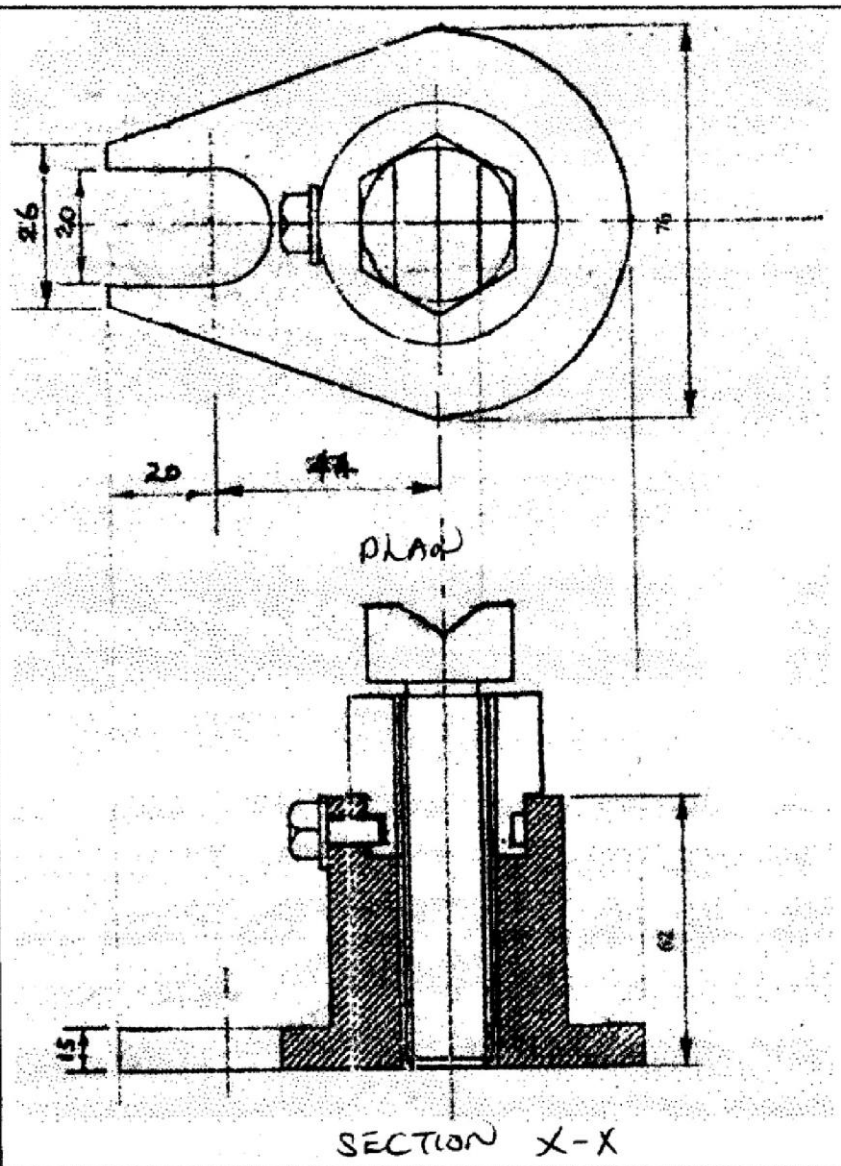
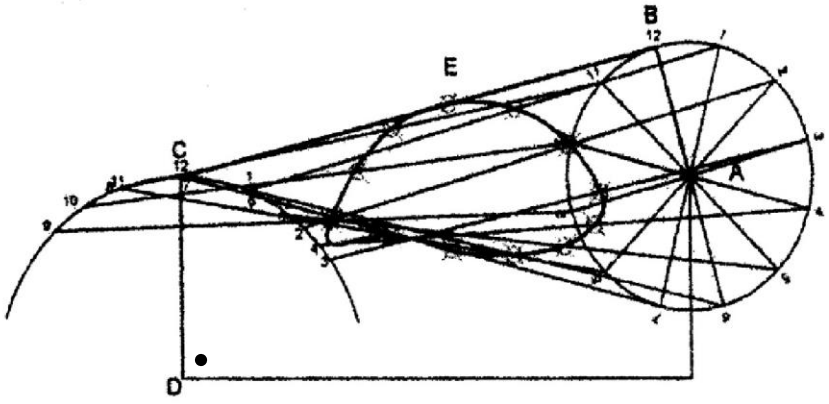
6 marks)

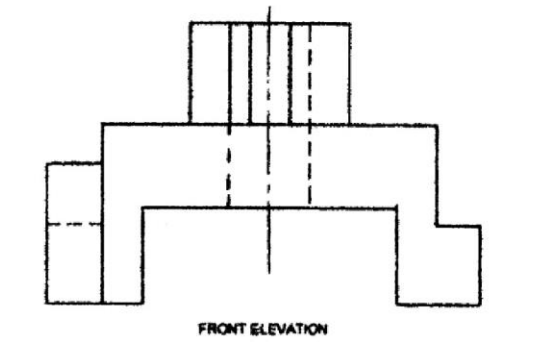
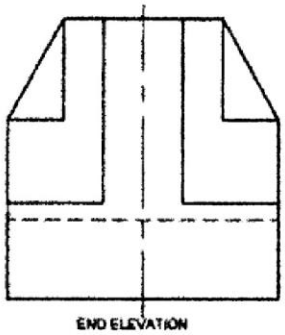
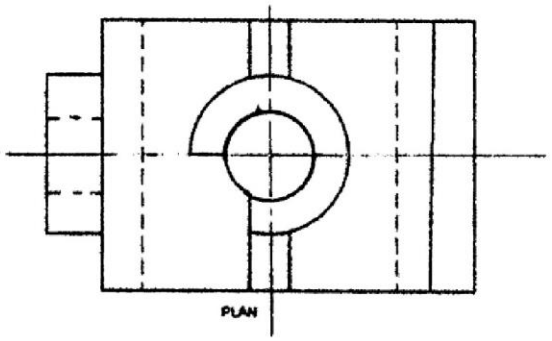
10.



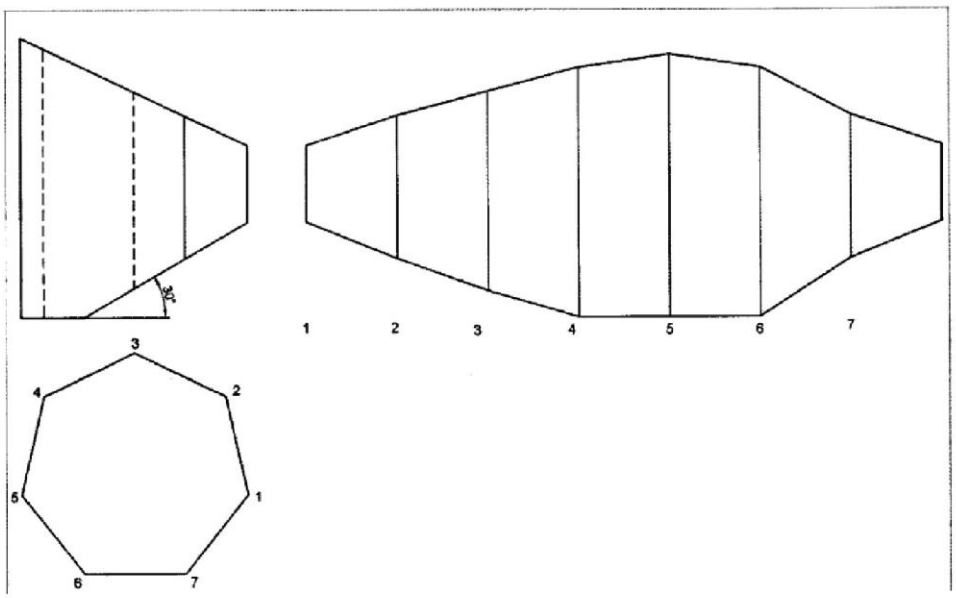
M/S.
4 faces @ 1 = 4
Proportionality = 1
Smooth curve = 1 (use of compass)

6 marks

11.		Correct angle of projection used = 1 mark 4 parts assembled correctly 4 x 2 = 8 marks Nut and post not sectioned = 2 marks Correct hatching of the base = 1 mark Centre lines across and horizontally = 2 marks Screw threads shown correctly = 2 marks Hexagonal head rep. correctly on plan = 2 marks Dimensions shown correctly 4 x ½ = 2 marks **20 marks**
12.		**M/S** (i) Copying the initial mechanism - 2 (ii) Drawing circle radius AB - 2 (iii) Dividing the circle into 12 divisions - 2 (iv) Projects points on circle to different points of C - 2 (v) Locating different positions of E - 2 (vi) Joining the points

		to get a smooth curve. - 3 (vii) Line work and neatness - 2 **15 marks**
13.	   	**Marking guide** Front Elevation 6 faces @ ½ = 3 marks 3 hidden details @ ½ = 1½ marks Plan 8 faces @ ½ = 4 marks 4 hidden details @ ½ = 2 marks Sectional End elevation 6 faces @ ½ = 3 marks 1 hidden details @ ½ = ½ marks Hatching at 2 places @ ½ = 1 mark **15 marks**

14.



M/S

CONSTRUCTION OF THE PLAN– 2

PROJECTING FROM PLAN – 1

DEVELOPING FROM F/ELEVATION – 2

PROJECTING VERTICAL LINES FROM BASE – 1

PROJECTIONS FROM P/E TO DEV. 11 @ ½ - 5½

DETERMINING THE POINTS – 2

PLOTTING SHAPE - 1½

15 MARKS