MARKING SCHEME
449/1
DRAWING AND DESIGN: FORM THREE
July/ Aug. 2023
2½ Hours

SECTION A (50 Marks)

Answer all the questions in this section in the spaces provided.

1 (a) Briefly explain why it is advisable to manufacture set squares and protractors using transparent plastics. (2mk)

- **To allow lines underneath to be seen.**
- **Light in weight**
- **durable**
- **corrosion resistant**

(b) State two disadvantages of using tape to mount drawing paper on drawing board   (2mk)

- Disdain the paper
- Peels the drawing paper

2 (a) Distinguish between a sector and a quadrant in a circle.   (2mks)

• A sector is a part of a circle bounded by two radii and an arc.
• A quadrant is part of a circle bounded by two radii at right angles and an arc.

(b) State The main function of a draughtsman.   (2mks)

- Make final/working drawings
- Reproduce drawings

3 (a) state six areas to be investigated in research and analysis in design process   (3mks)

- Function
- Strength Of Materials
- Materials
- Shape And Form
- Jointing Methods
- Safety
- Economics
- Surface Finish
- Fittings

(b) Define each of the following properties of materials:

i.   Ductility. **Ability of a material to be drawn into a wire without rupturing**
ii. Fusibility. Ability of a material to melt   (4mks)

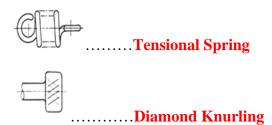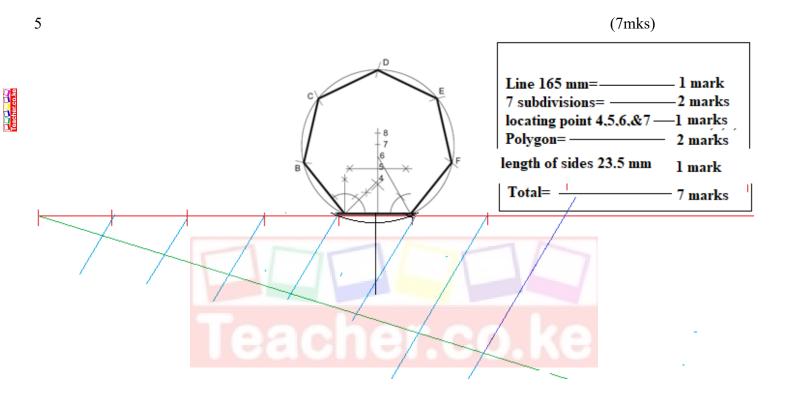4 Identify the following conventions: (2mks)

   …………**Circles On The Same Pitch**

……**Bearing**

………**Tensional Spring**

…………**Diamond Knurling**

5   (7mks)

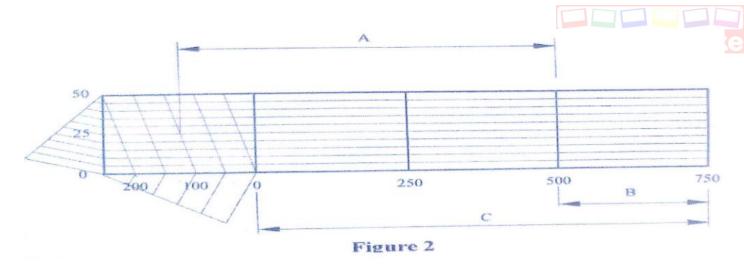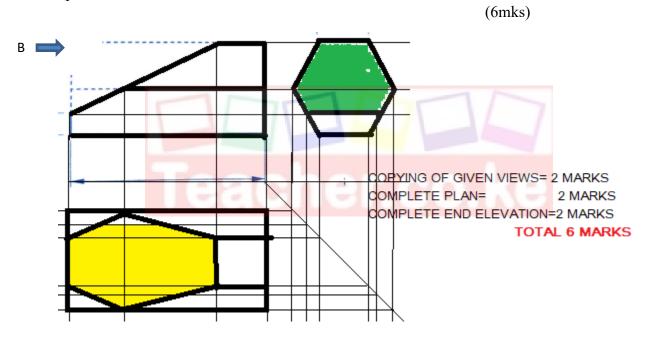| Line 165 mm= | 1 mark |
7 subdivisions=	2 marks
locating point 4,5,6,&7	1 marks
Polygon=	2 marks
length of sides 23.5 mm	1 mark
Total=	7 marks

6 (a) **Figure 2** shows a diagonal scale of 1: 10 to measure to a maximum length of 1m with an accuracy of 0.005m. Give the following readings.   (3mks)

   I.   A……………………………………**625M**………………………………………………………….

   II.   B…………………………………**250M**……………………………………………………………..

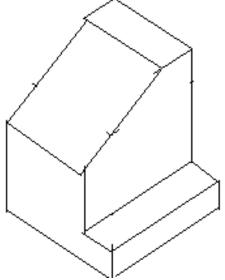   III. C…………………………………**750M**……………………………………………………………..

Figure 2

(b) **Figure 3** shows an elevation of part of a hexagonal prism and an incomplete end elevation drawn in first angle projection. Draw:

   i.   The end elevation in the direction of arrow B;
   ii.   The plan.

(6mks)

COPYING OF GIVEN VIEWS= 2 MARKS
COMPLETE PLAN=   2 MARKS
COMPLETE END ELEVATION=2 MARKS
TOTAL 6 MARKS

7 **Figure 4** shows three views of a block drawn in first angle projection. Sketch proportionately, the isometric view of the block taking X as the lowest point.   (5mks)
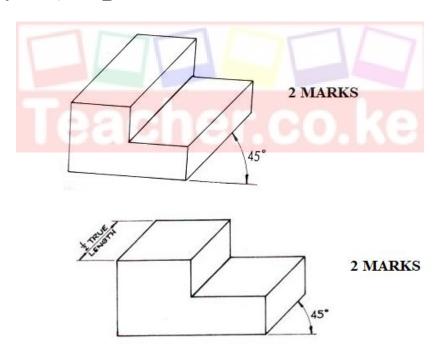
3

CORRECT PROJECTION= 2 MARKS
6 CORRECT FACES= 3 MARKS
TOTAL 5 MARKS

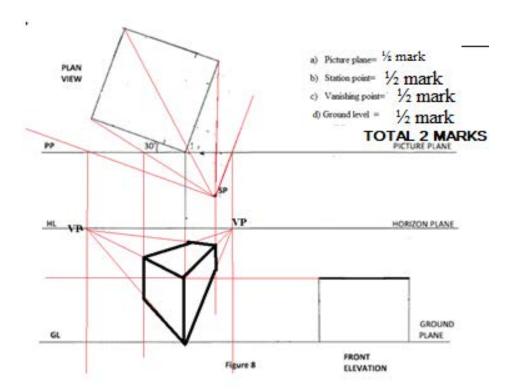8 **Figure below** shows two orthographic views of a block. From the two views,

Sketch the oblique views in

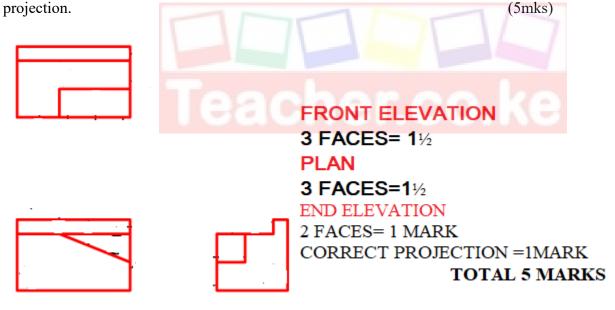   i.   Cavalier
    ii.   Cabinet projection (4MKS_)

2 MARKS

45°

2 MARKS

½ TRUE LENGTH

45°

9 Sketch and show the following features in two-point perspective drawing:

4

PLAN VIEW

a) Picture plane = ½ mark
b) Station point = ½ mark
c) Vanishing point = ½ mark
d) Ground level = ½ mark

TOTAL 2 MARKS
PICTURE PLANE

PP 30°

SP

HL VP VP

HORIZON PLANE

GL

GROUND PLANE

FRONT ELEVATION

Figure 8

10 **Figure 6** shows a pictorial view of a block. Draw the three orthographic views of the block in third angle projection. (5mks)

FRONT ELEVATION
3 FACES= 1½
PLAN
3 FACES=1½
END ELEVATION
2 FACES= 1 MARK
CORRECT PROJECTION =1MARK
TOTAL 5 MARKS

Section B (20 marks)

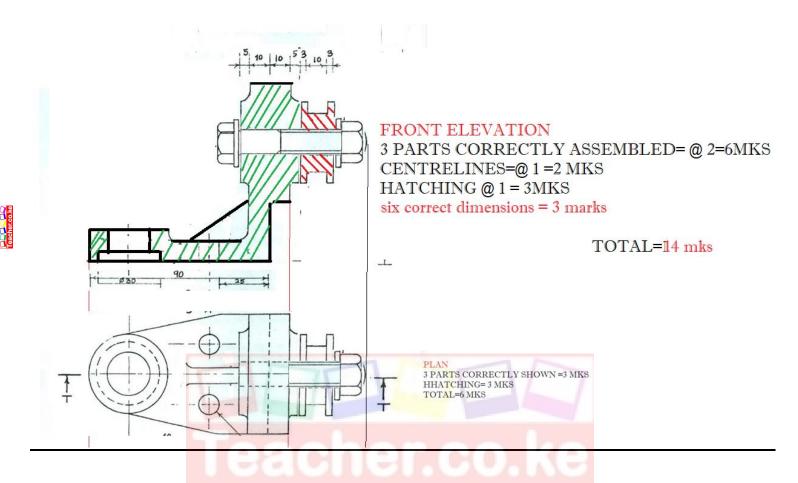This question is **compulsory:**

It should be answered on the A3 paper provided.

*Candidates are advised **not to spend more than one hour** on this question*

11. **Figure 6** shows parts of a towing device drawn in first angle projection. Assemble the parts and draw
full size the following views in third angle projection:

5

(a)   Sectional front elevation along the cutting plane T-T
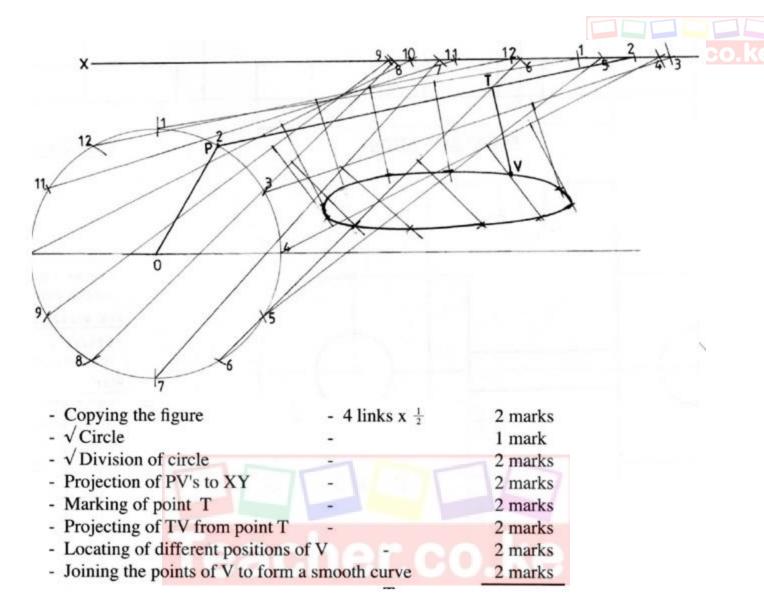(b)   The Plan
(c)   Insert leading dimensions

FRONT ELEVATION
3 PARTS CORRECTLY ASSEMBLED= @ 2=6MKS
CENTRELINES=@ 1 =2 MKS
HATCHING @ 1 = 3MKS
six correct dimensions = 3 marks

TOTAL=14 mks

PLAN
3 PARTS CORRECTLY SHOWN =3 MKS
HHATCHING= 3 MKS
TOTAL=6 MKS

Section C (30 marks)

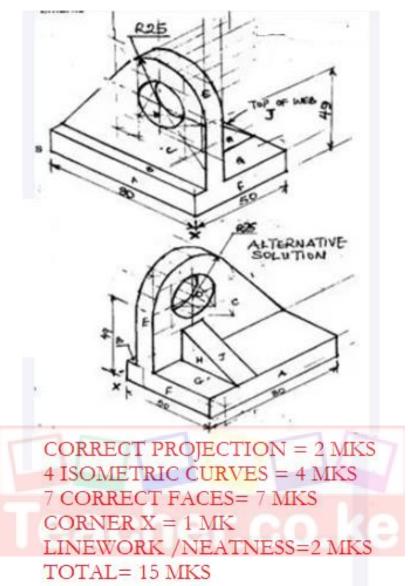*Answer Any Two questions from this section.*

*This question is **compulsory**.*

12. **Figure8** shows a crank mechanism in which point U reciprocates along XY as P rotates about O.
    VT is fixed at right angle to PU at T.

6

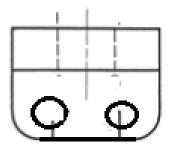|		
- Copying the figure	- 4 links x $\frac{1}{2}$	2 marks
- √ Circle	-	1 mark
- √ Division of circle	-	2 marks
- Projection of PV's to XY	-	2 marks
- Marking of point T	-	2 marks
- Projecting of TV from point T	-	2 marks
- Locating of different positions of V	-	2 marks
- Joining the points of V to form a smooth curve		2 marks

TOTAL 15 MARKS

13. **Figure 9** shows the three orthographic views of a machined block drawn in first angle projection. Draw full size, the isometric view of the block taking corner X as the lowest point. (15mks).

R25

TOP OF WEB
J

ALTERNATIVE
SOLUTION

CORRECT PROJECTION = 2 MKS
4 ISOMETRIC CURVES = 4 MKS
7 CORRECT FACES= 7 MKS
CORNER X = 1 MK
LINEWORK /NEATNESS=2 MKS
TOTAL= 15 MKS

14 **Figure 10** shows a block drawn in isometric projection. Draw FULL SIZE in first angle projection the three orthographic views of the block.   (15mks)

FRONT ELEVATION
2 FACES=2
1 HOLES=1
2 CENTRELINE=2
HIDDEN DETAILS=1
PLAN
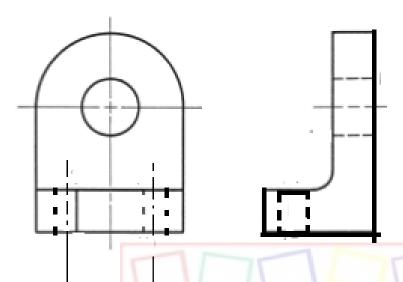2 FACES=2
2 HOLES=2
HIDDEN DETAILS=1
END ELEVATION
1 FACE =1
HIDDEN DETAILS=2
LINEWORK=1MK
TOTAL 15 MARKS

9