FORM 2 TERM ONE 2024

DRAWING AND DESIGN

Marking scheme

1. Define the following terms

(a) What is a Quadrilateral? (1 mark)

Is a plane figure bounded by four straight sides with the sum of all interior angles adding up to 360^0.

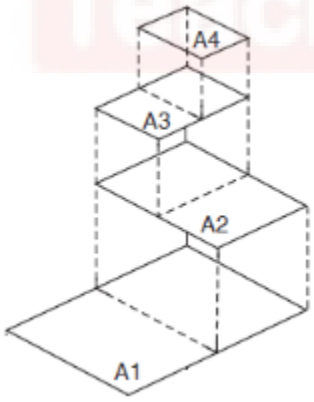
(b) Assembly drawing (1 mark)

A drawing that shows the various parts of a machine in their correct working locations.

2. State any four areas which are involved in research and analysis of design item. (2 marks)

- ✓ function,
- ✓ strength of materials,
- ✓ shape and form,
- ✓ jointing
- ✓ shaping and forming
- ✓ fitting safety
- ✓ surface finish
- ✓ economics

3. (a) illustrate using sketches how to show the following sizes of drawing papers A_1, A_2, A3, A_4. (2 marks)

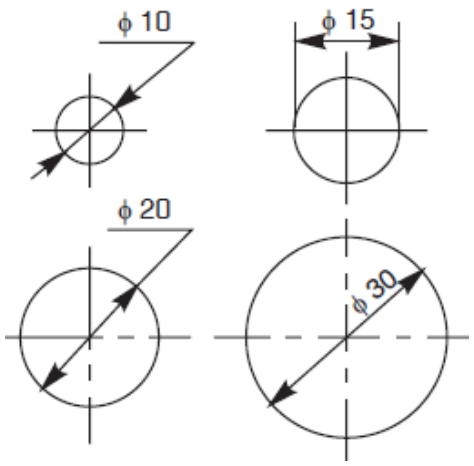


EACH SIZE DRAWN CORRECTLY = 1X4= 4 MARKS

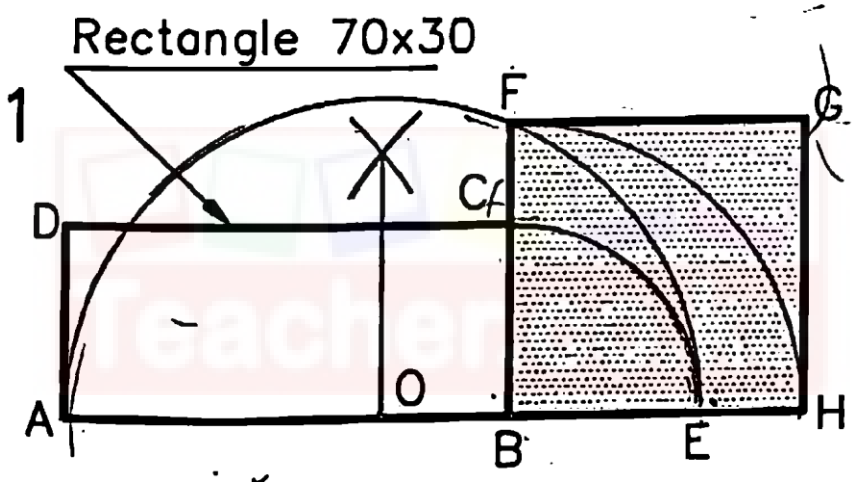
(b) State four main ways of communicating ideas in design process (2 marks)

- ➢ Sketches
- ➢ Words
- ➢ Diagrams
- ➢ Models / mock ups
- ➢ Exploded drawings

4. Illustrate three ways of dimensioning a diameter of a circle. (3 marks)



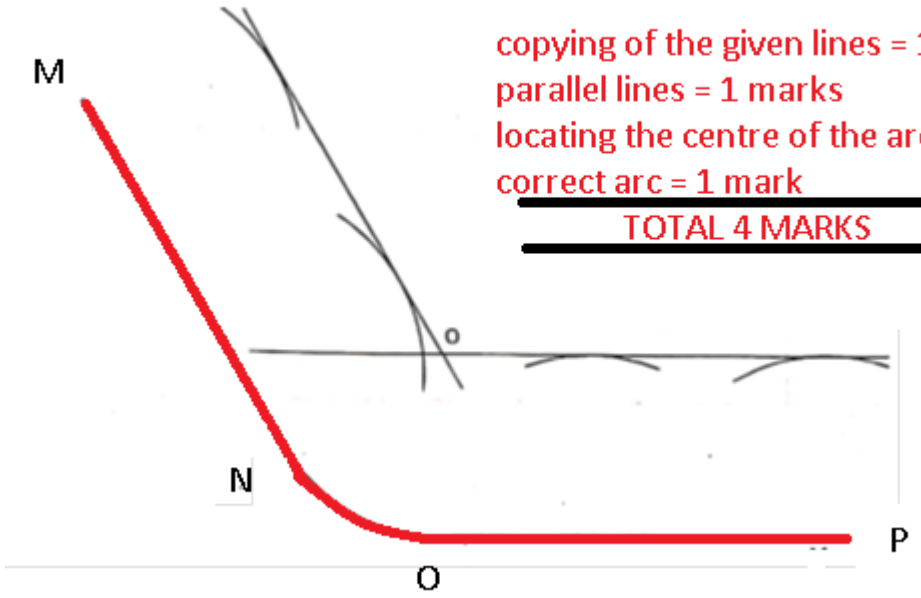
5. Construct a rectangle measuring 70mm by 30mm and convert to a square of equal area. (6 marks)



- ✓ Construction of a rectangle= 2 marks
- ✓ Extension of base by width=1 mark
- ✓ Bisection of new base= 2 marks
- ✓ Semi-circle= 2 marks
- ✓ One side of square= 1 mark
- ✓ Correct square= 2 marks

TOTAL= 6 MARKS

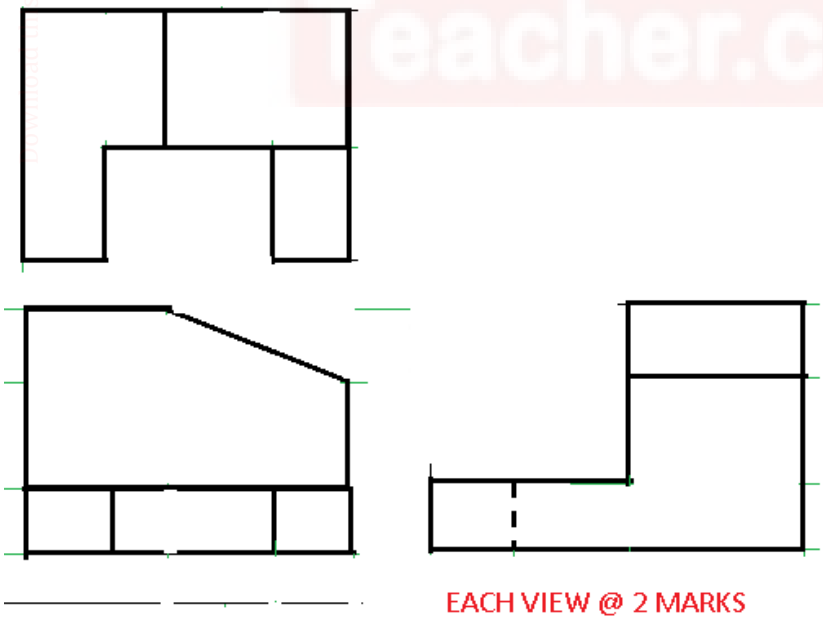
6. Join the lines drawn below with an arc of radius 50mm (4 marks)



copying of the given lines = 1 mark
parallel lines = 1 marks
locating the centre of the arc = 1 mark
correct arc = 1 mark
TOTAL 4 MARKS

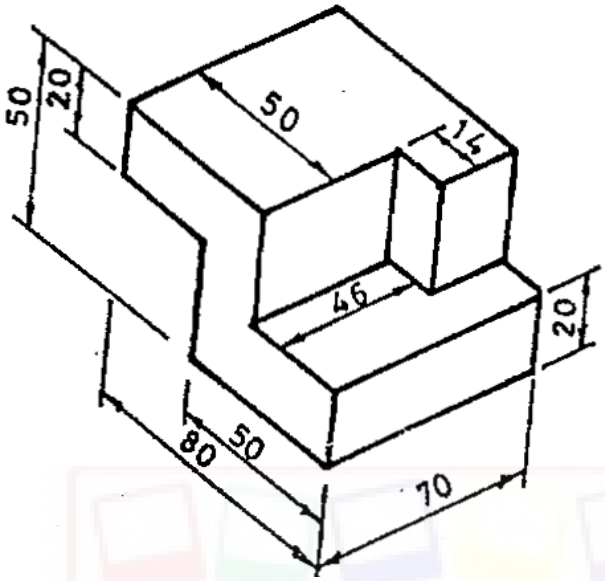
7. **Figure 1** below shows a pictorial view of a block.

   Using a third angle projection, sketch in good proportion the orthographic views of the block. (6 marks)



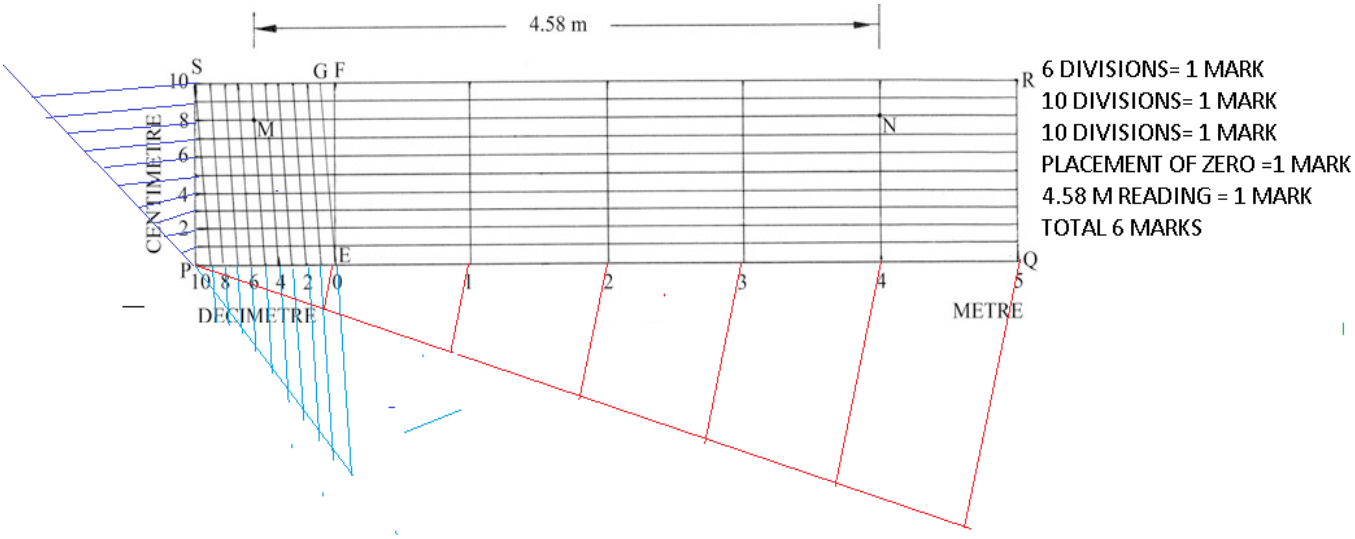
EACH VIEW @ 2 MARKS
TOTAL 2X3= 6MARKS

8. Figure 4 shows two views of a block drawn in first angle projection.
In good proportion, sketch two possible pictorial views of the block in oblique projection. (10 marks)



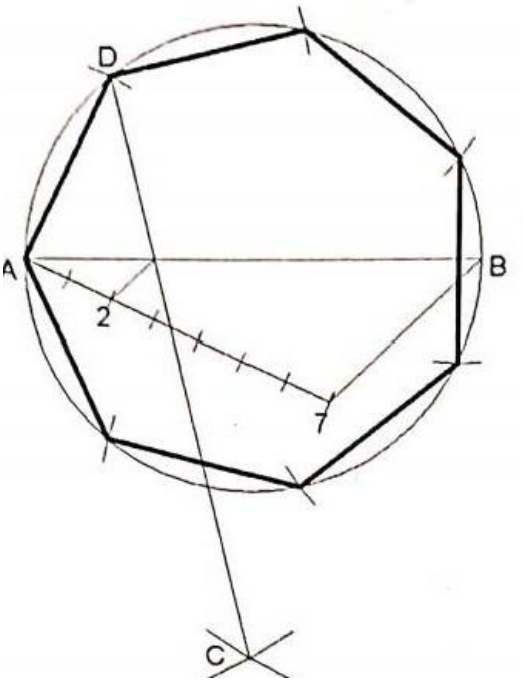
ISOMETRIC PROJECTION=2 MARKS
7 CORRECT FACES 1@X7= 7 MARKS
LINE WORK /NEATNESS= 1 MARK
TOTAL 10 MARKS

9. Construct a diagonal scale to read up to (1/100)th of a metre and long enough to measure up to 6 m. Take RF ¼ 1:50 and mark on the scale a distance of 4.58 m. (6 marks)



6 DIVISIONS= 1 MARK
10 DIVISIONS= 1 MARK
10 DIVISIONS= 1 MARK
PLACEMENT OF ZERO =1 MARK
4.58 M READING = 1 MARK
TOTAL 6 MARKS

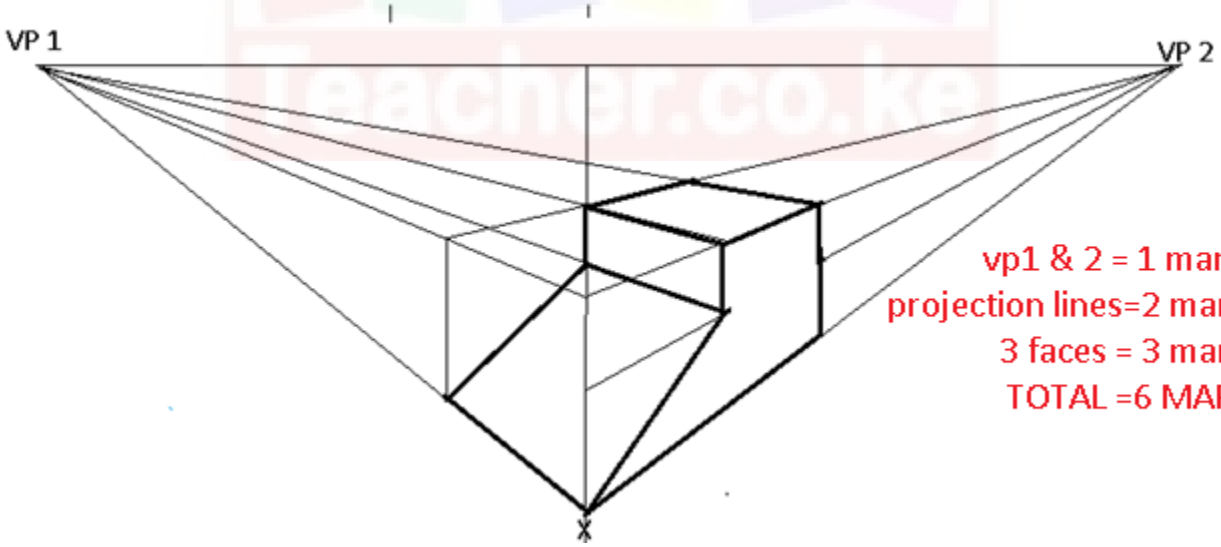
10. construct a regular heptagon inside a circle whose diameter is 60 mm. (6 marks)



Circle DIA 60= 1 mark
Dividing diameter into 7 parts= 1 mark
Arcs on diameter= 1 mark:
Drawing line CD= 1 mark
Drawing Heptagon= 2 **marks**

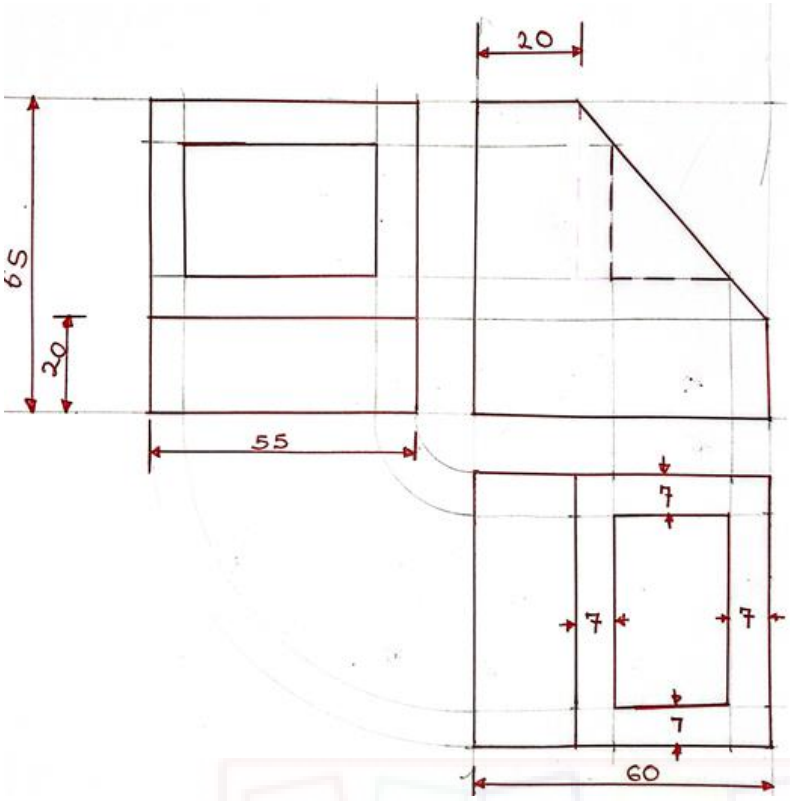
Total =6 marks

11. Figure **5** shows two views of a block drawn in first angle projection. Draw the block in two point perspective taking **X** as the lowest point. (6 marks)



vp1 & 2 = 1 mark
projection lines=2 marks
3 faces = 3 marks
TOTAL =6 MARKS

12. Fig 6 below shows a block drawn in **oblique**, draw the following views in third angle orthographic projection and dimension fully. (15 marks)



FE
1 FACE=1 MARK
2 HIDDEN DETAILS=1 MARK

END ELEVATION
3 FACES @ $1^1/_2$ Mark $=4^1/_2$ marks

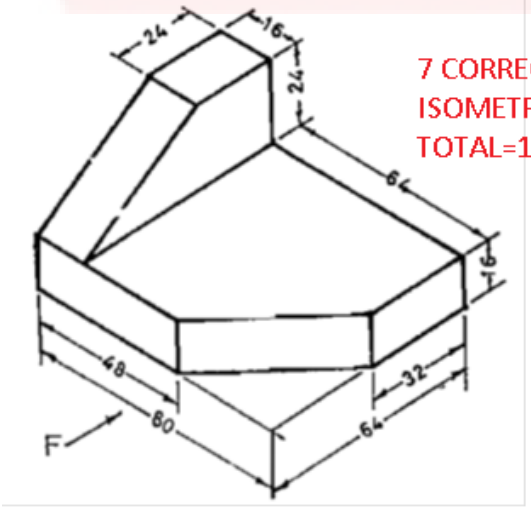
PLAN
3 FACES @ $1^1/_2$ Mark $= 4^1/_2$ Mark

6 CORRECT DIMENSIONS= 3 MARKS

LINE WORK / NEATNESS = 1 MARK

TOTAL 15 MARKS

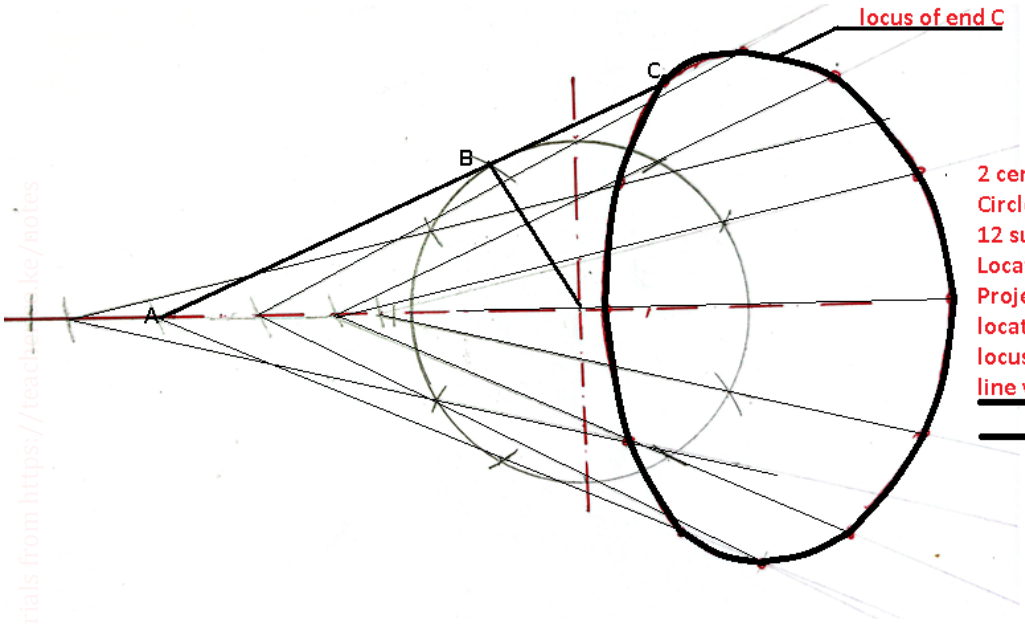
13. **Figure 5** shows two views of a machine component drawn in first angle. Draw the block in isometric projection. **(15 marks)**



7 CORRECT FACES=@ 2 X 7= 14 MARKS
ISOMETRIC PROJECTION = 1 MARK
TOTAL=15 MARKS

14. Figure **2** below shows a reciprocating water pump system.

Draw the locus of point **"C"** when the crank **BO** makes one complete revolution given that **B** is pin jointed to **AC** and **A** is allowed to move horizontally. (15 marks)



2 centrelines=2 marks
Circle OB=2 marks
12 sub-divisions=2 marks
Locating A1-A12=2 marks
Projections of A-B-C=2 marks
locating C1-C12=2 marks
locus of end C= 2 marks
line work/neatness= 1marks

TOTAL = 15 MARKS