

MARKING SCHEME

Kenya Certificate of Secondary Education

DRAWING AND DESIGN

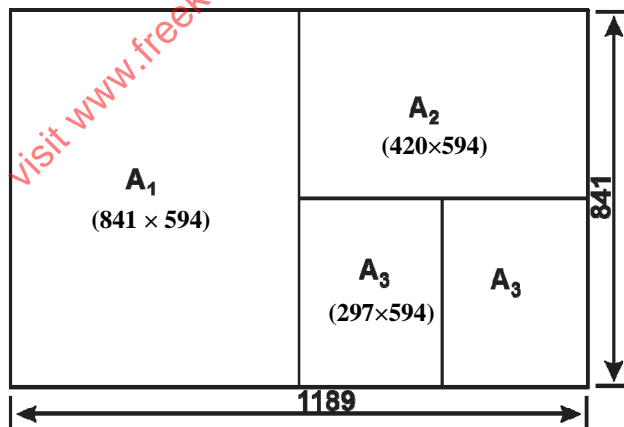
MARKINGSCHEME

SECTION A (50 marks) Answer ALL the questions in this section in the spaces provided.

1. **Explain technical drawing as means of communication.** (3 marks)
 - i) is a discipline that is able to be understood world wide by those who have studied it. It is made possible due to the standardization of conventions, abbreviation and symbols.
 - ii) NB: Technical drawing is a means of communication between engineers and / or designers and the production / manufacturing industries. 3 marks

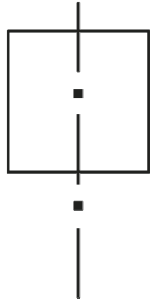
2. **Name three types of lines and specify the pencil grade to be used in each case.** (3 marks)
 - i) Thick continuous - visible outlines B or HB
 - ii) Medium Thin Cont - Dimensional or external outlines.
- 2 H or H
 - iii) Very thin cont. lines - construction or guide lines - 3H or 4H. 3 marks

3. a) **Illustrate how an A0 drawing paper can be sub-divided to generate paper sizes A1, A2 and A3.** (3 marks)

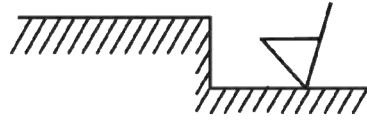


- b) **Show dimensions of**
- $$A0 = 841 \times 1189 = 841 \times 1189$$
- $$A1 = 841 \times \frac{1189}{2} = 841 \times 594$$
- $$A2 = \frac{841}{2} \times 594 = 420 \times 594$$
- $$A3 = \frac{594}{2} \times 420 = 297 \times 420$$

4. Use standard symbols and abbreviations to represent each of the following:



i) Cylinder



ii) Machined surface.

(4 marks)

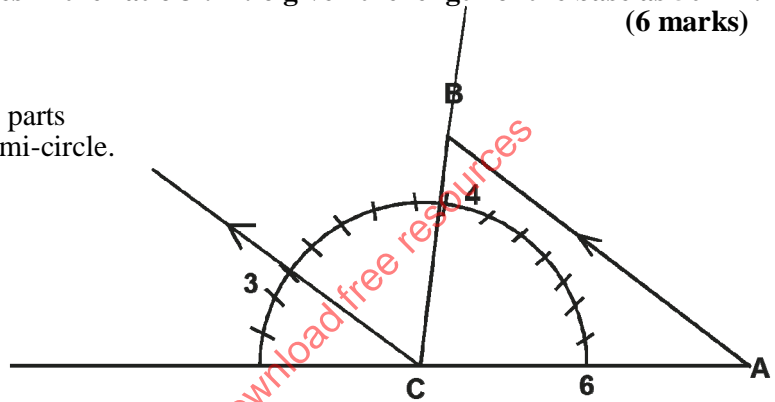
5. Construct a triangle ABC with angles in the ratio 3 : 4 : 6 given the length of the base as 50mm. (6 marks)

Solution

$$3 + 4 + 6 = 13$$

Draw semi-circle and divide it into 13 parts

Single-out the ratios 3 : 4 : 6 on the semi-circle.



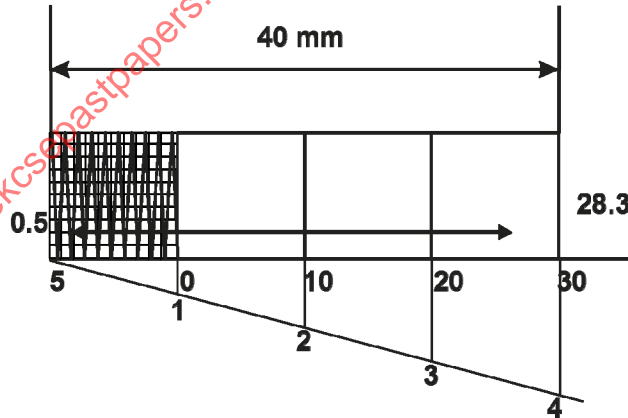
6. Construct a diagonal scale of 2 : 1 having an accuracy of 0.1mm to read to a maximum of 40mm. Show a reading of 28.3mm (6 marks)

Solution

Scale length

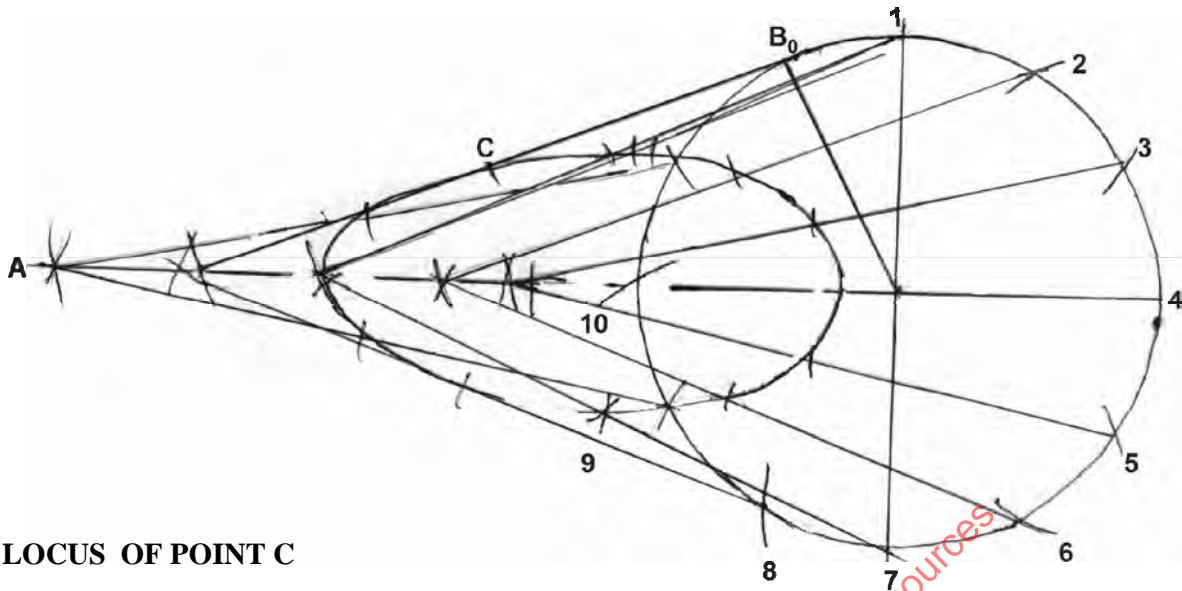
$$= R.F \times \text{MAX. LENGTH}$$

$$= \frac{2}{1} \times 40\text{mm} = 80\text{mm}$$



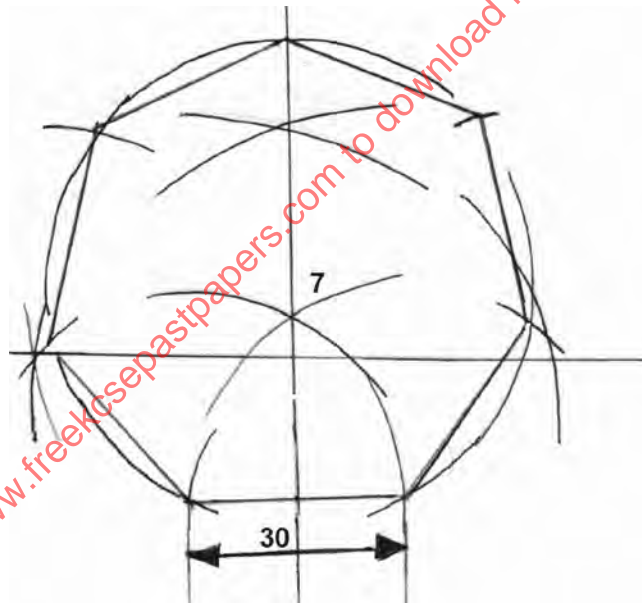
7. Locus of point C for one revolution of crank OB

(6 marks)

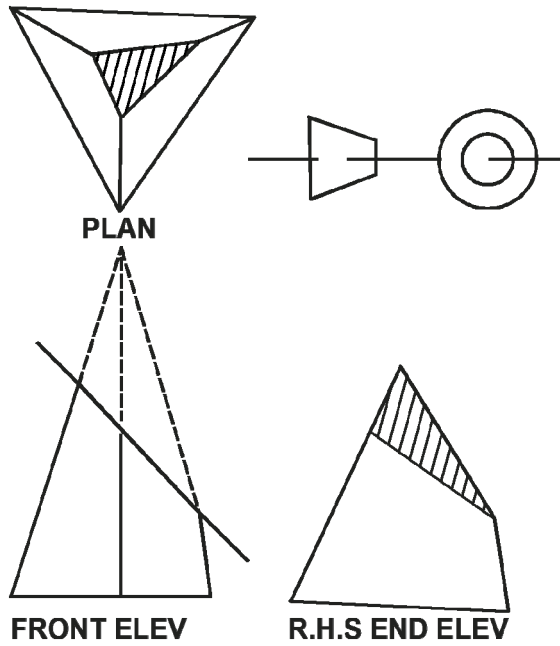


LOCUS OF POINT C

8. Using a ruler and pair of compasses only, construct a REGULAR HEPTAGON. Whose sides are 30mm long. (6 marks)



HEPTAGON
SIDES 30mm



9.

(6 marks)

TRUNCATED TRIANGULAR PYRAMID

10. Define the following properties of materials:-

- i) **Hardness** - when it can withstand scratching, wear or Abrasion, indentation by harder bodies. e.g. marking knife, files etc.
- ii) **Toughness** - the ability of a material to withstand impact load or hammering load.
- iii) **Elasticity** - Ability of a material to deform under load and return to its original shape or size when the load is removed. So long as it does not exceed its elastic limit.
- iv) **Plasticity** - ability of a material to deform under load and retain its new shape when the load is removed. e.g. soft steel.

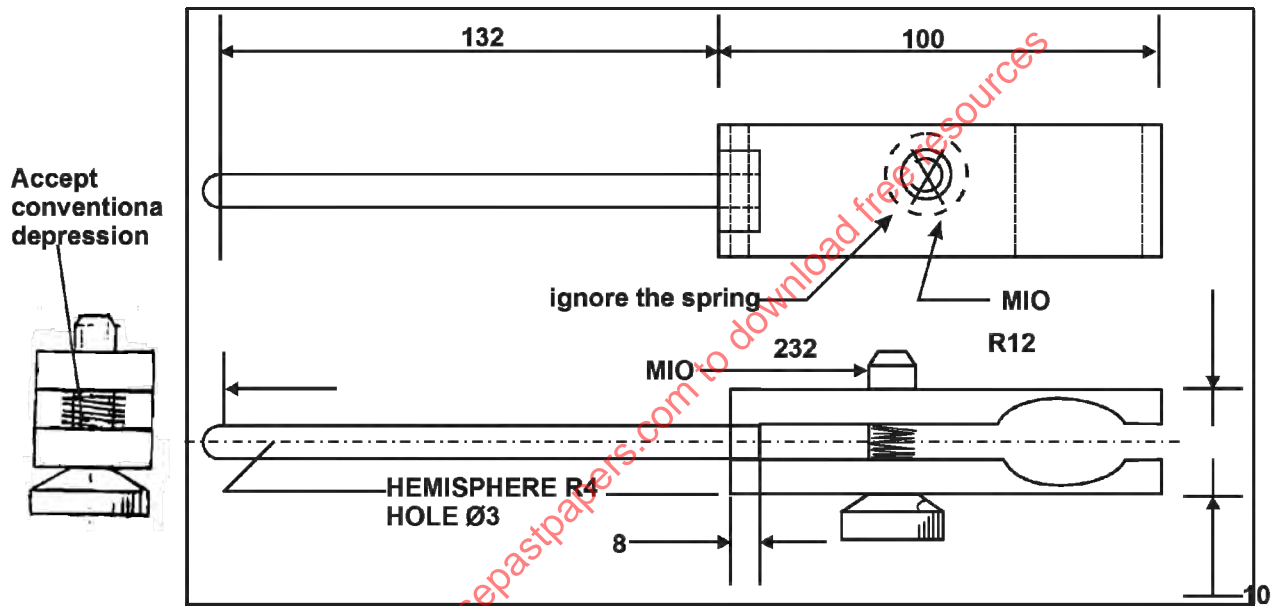
(4 marks)

SECTION B (20 marks) This question is compulsory. Candidates are advised to spend not more than one hour on this question.

11. Figure 7 shows parts of a retort stand clamp drawn in first angle projection. Assemble the parts and draw FULL SIZE, the following views of the vice in third angle projection:

- a) A sectional front elevation along the cutting plane P - P
- b) End elevation in the direction of arrow X
- c) Plan

Insert three leading dimensions and do not show hidden details.



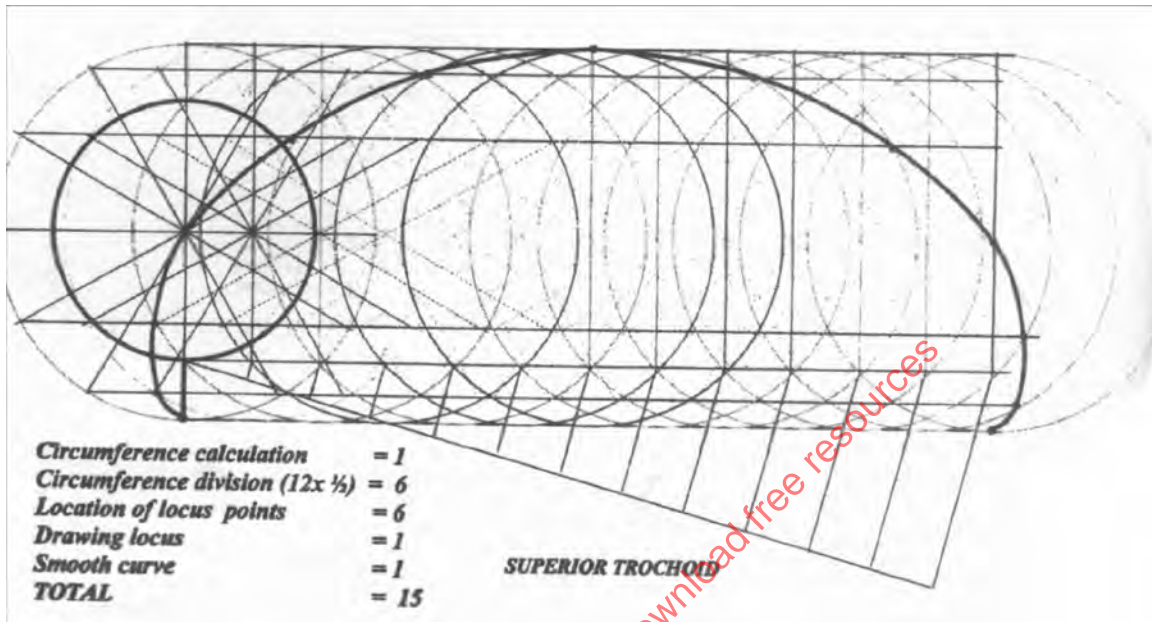
PARTS NAME	MATL	NO. OFF
E PIN	M.S	1
D SCREW	M.S	1
C LOWER JAW	M.S	1
B UPPER JAW	M.S	1
A SCREWED ROD	M.S	1
SCALE	1 : 1	NAME

SECTION C (30 marks)

12. Figure 8 shows the mouth of a cup having $\text{Ø}45\text{mm}$ and a handle protruding 10 mm.

If the cup is rolled on the surface AA for one complete revolution, construct the locus of point X on the handle. (15 marks)

SOLUTION



13. Figure 9 shows a square pyramid transacted along X - X and Y - Y.

Copy the given front elevation, complete the plan and draw the end elevation in the direction of arrow U. (15 marks)

14. Make an isometric drawing from the two views given in FIGURE. (15 marks)

