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APPLIED GEOMETRY

June/July 2022

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

ARTISAN CERTIFICATE IN

**GENERAL FITTER
MOTOR VEHICLE MECHANICS
AGRICULTURAL MECHANICS
WELDING AND FABRICATION
ELECTRICAL INSTALLATION
CARPENTRY AND JOINERY**

**PAINTING AND DECORATION
MASONRY
PLUMBING
GARMENT MAKING
LEATHERWORK TECHNOLOGY
GENERAL AGRICULTURE**

APPLIED GEOMETRY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Drawing paper size A3;

Drawing instruments;

Scientific calculator.

*This paper consists of **THREE** sections; **A**, **B** and **C**.*

*Section **A**: Answer **ALL** questions.*

*Section **B**: Answer any **ONE** question.*

*Section **C**: Answer any **TWO** questions.*

All answers must be done on the drawing papers provided.

Do not erase construction lines.

Candidates should answer the questions in English.

This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (40 marks)

Answer **ALL** the questions in this section.

1. State two properties of a standard drawing paper. (2 marks)
2. In a height of 5 mm, print vertically the alphabetical letters A to R in upper case. (3 marks)
3. Draw a triangle with a perimeter of 130 mm and base angles of 45° and 60° respectively. (5 marks)
4. Using concentric circles method, construct an ellipse of major axis 80 mm and minor axis 50 mm. (5 marks)
5. Figure 1 shows a shape of a pad. Draw the pad and show the centres of the arcs. (4 marks)

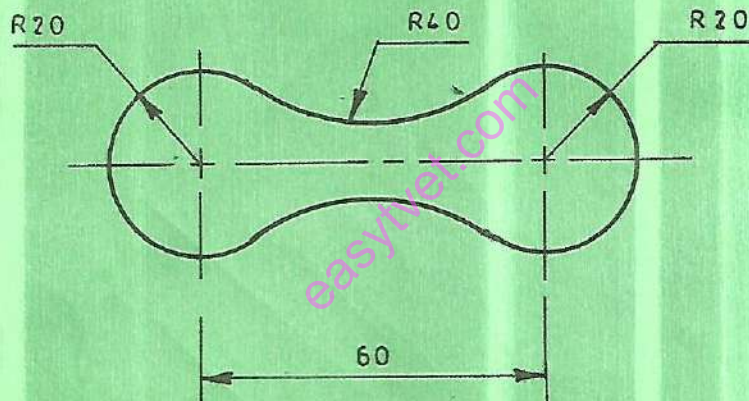


Fig. 1

6. Figure 2 shows a front elevation of a truncated cylinder. Draw the given view and the true shape of the cut surface. (5 marks)

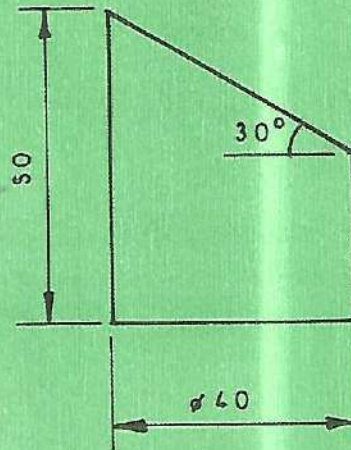


Fig.2

7. Construct a plain scale, 40 mm = 10 mm, 30 mm long to read 1 mm. (3 marks)
8. Figure 3 shows orthographics views of a shaped block. Make a free hand sketch of the block in isometric projection. (5 marks)

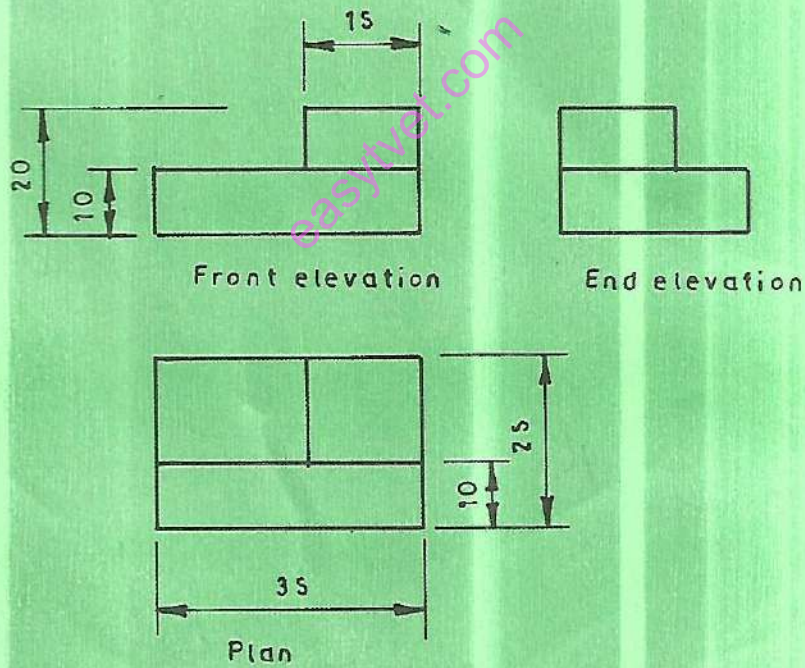


Fig.3

9. Figure 4 shows location of a point P on the circumference of a circle. Draw a tangent touching the the circle at point P. (3 marks)

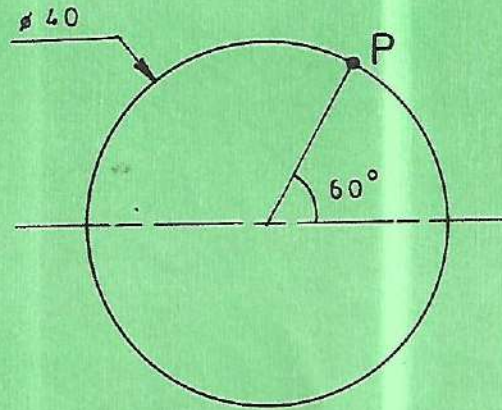


Fig. 4

10. Using a universal method, construct a regular pentagon in a circle of 70 mm diameter. (5 marks)

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SECTION B (30 marks)

Answer only **ONE** question from this section.

11. (a) Figure 5 shows orthographic views of an object drawn in first angle projection. Draw full size isometric view of the object. (30 marks)

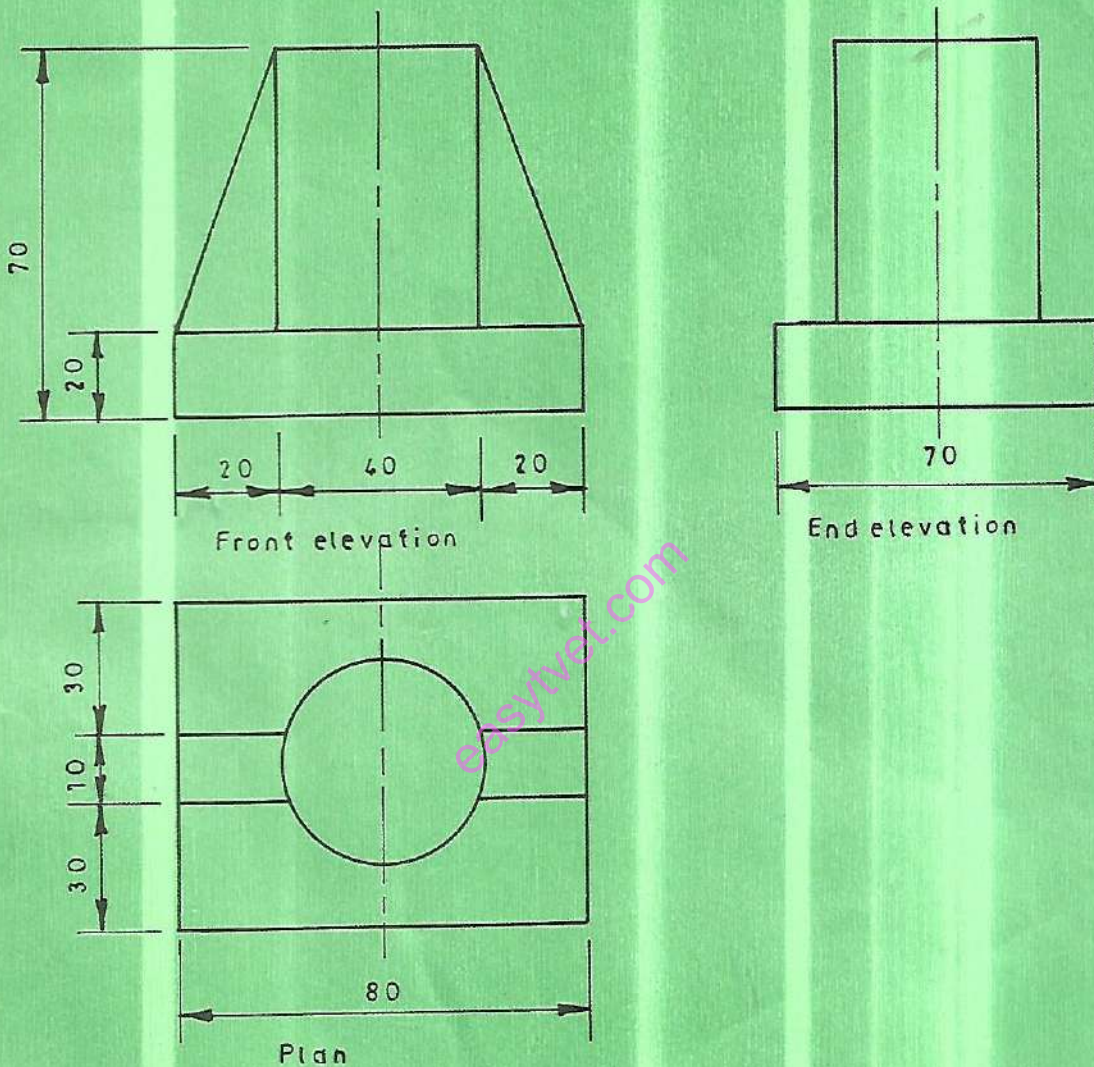
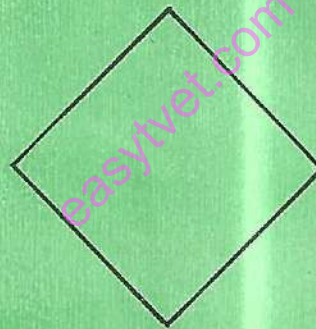
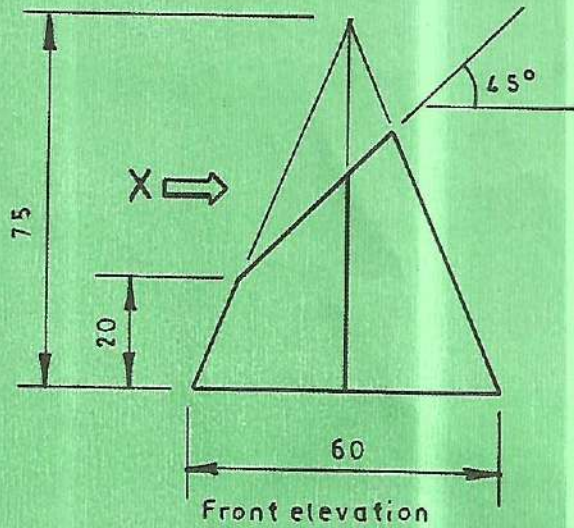


Fig. 5

12. Figure 6 shows a front elevation and incomplete plan of a truncated square pyramid. Copy the given front elevation and draw the following:

- (i) end elevation in the direction of arrow X;
- (ii) complete plan;
- (iii) true shape of the cut surface;
- (iv) surface development.

(30 marks)



Plan

Fig.6

13. Figure 7 shows a pictorial view of a block in isometric projection. Draw the orthographic views of the block in third angle projection. (30 marks)

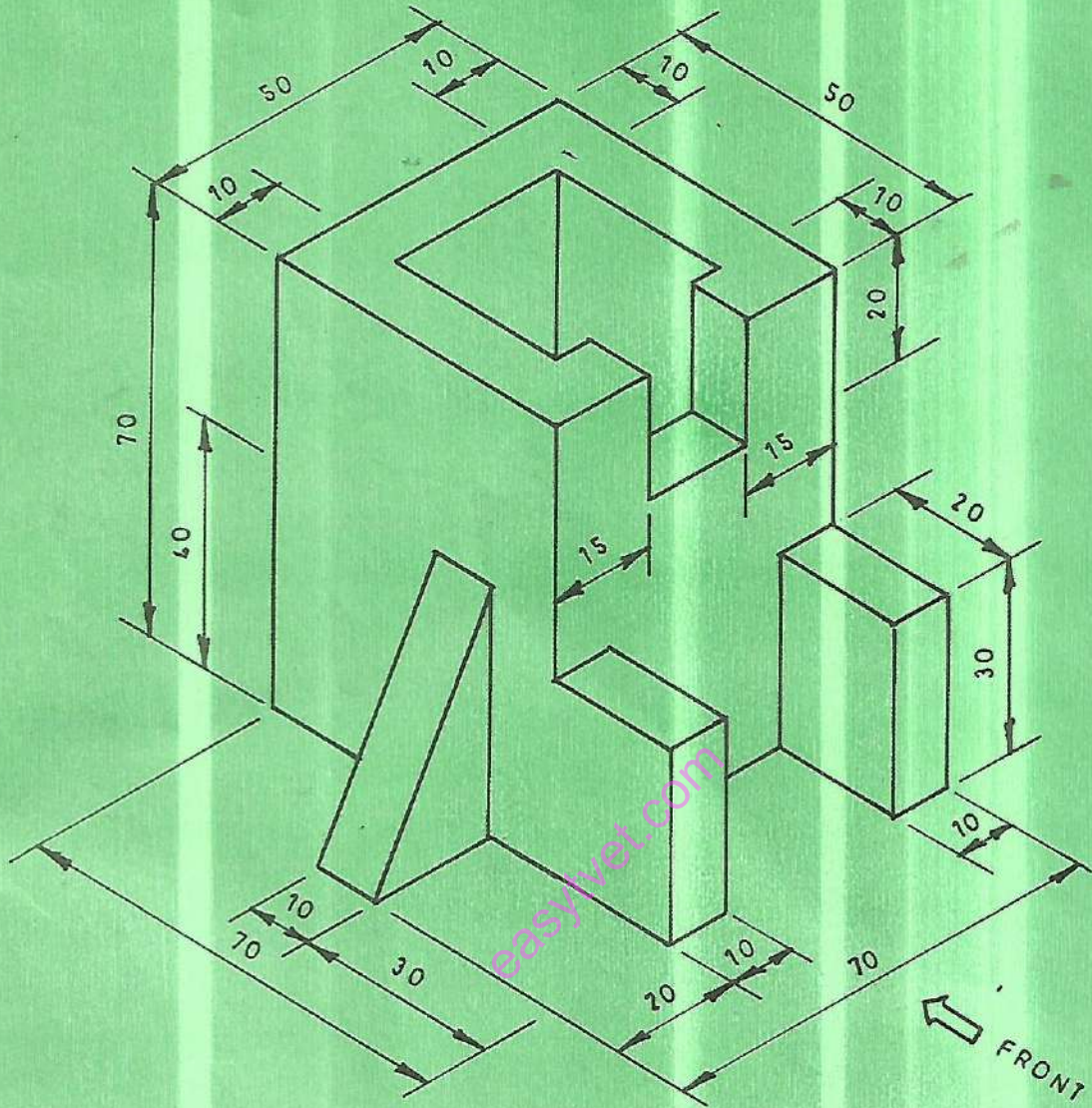


Fig.7

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SECTION C (30 marks)

Answer any TWO questions from this section.

14. In an archimedean spiral, the nearest point A is 15 mm from the centre of a circle while the furthest point B is 75 mm from the centre. Draw the spiral. (15 marks)

15. Make free hand sketches of the following:

- (i) Watering can;
- (ii) Soldering iron;
- (iii) Scissors;
- (iv) Painting brush;
- (v) pliers.

(15 marks)

16. (a) Figure 8 shows two circular pipes intersecting at right angles. Copy the given the view and draw the following:

- (i) Line of intersection;
- (ii) Surface development of pipe B for half a turn.

(15 marks)

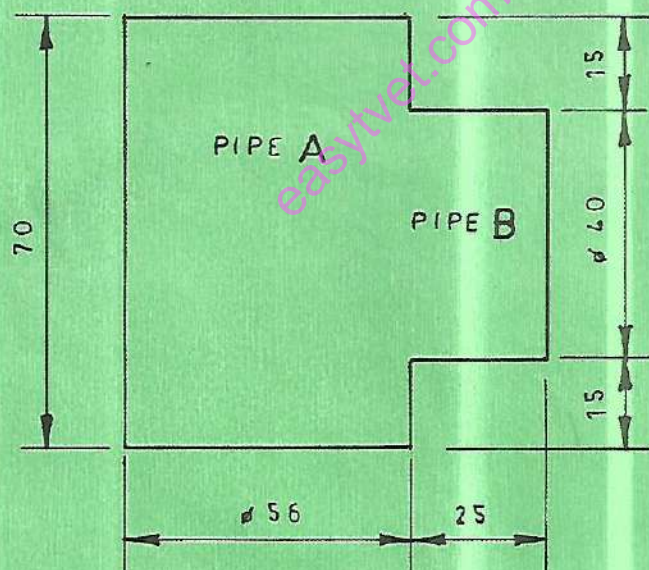


Fig.8

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