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SUPPORT SUBJECTS

June/July 2021

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

ARTISAN CERTIFICATE

GENERAL FITTER	MASONRY
MOTOR VEHICLE MECHANICS	PLUMBING
AGRICULTURAL MECHANICS	GARMENT MAKING
WELDING AND FABRICATION	FOOD BEVERAGE
	PRODUCTION AND SERVICE
ELECTRICAL INSTALLATION	LEATHER WORK
CARPENTRY AND JOINERY	GENERAL AGRICULTURE
PAINTING AND DECORATING	

SUPPORT SUBJECTS

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Mathematical tables;

Drawing instruments.

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

Answer ALL the questions in part I of each section, any TWO questions in part II of sections A and B and any FIVE questions in part II of section C.

Maximum marks for each part of a question are shown.

Candidates should answer the questions in English.

This paper consists of 8 printed pages.

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

SECTION A: MATHEMATICS

PART I (24 marks)

Answer ALL questions in this part.

1. Factorise the quadratic expression

$$x^2 - 7x + 10.$$

(3 marks)

2. Figure 1 shows a right angled triangle.

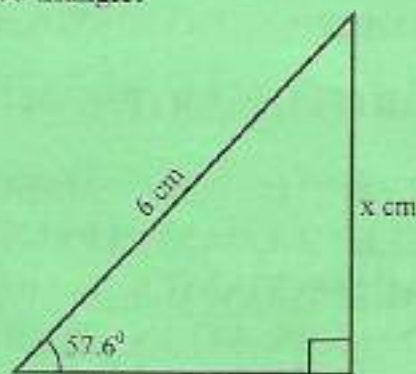


Fig. 1

Use trigonometric ratios to find the value of x .

(3 marks)

3. Jane bought a dress at Kshs 3500 and later sold it at Kshs 2800. Determine the percentage loss she incurred.

(3 marks)

4. Using mathematical tables, evaluate:

$$\frac{291 \times 681}{675}$$

(3 marks)

5. Simplify $\frac{6^3 \times 5^2 \times 4^3}{4^2 \times 5^4 \times 6^5}$.

(3 marks)

6. Make a the subject of the formula $v = u + at$.

(3 marks)

7. Determine the area of the sector of a circle of radius 3 cm if the angle subtended at the centre is 140° . (Take $\pi = \frac{22}{7}$)

(3 marks)

8. Convert the recurring decimal $0.\overline{73}$ into a fraction.

(3 marks)

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PART II (16 marks)

Answer any TWO questions from this part.

9. The cost of 4 handkerchiefs and 3 pairs of socks is Kshs.340. If 3 handkerchiefs and 4 pairs of socks cost Kshs.395. Determine the price of each item. (8 marks)

10. Table 1 shows the masses of children in a play group.

Table 1

Mass (kg)	35.4	36.8	38.2	40.0	40.2	41.0	41.4
No. of children	4	3	2	2	2	14	8

- (a) Determine the
 (i) mean;
 (ii) mode. (5 marks)
- (b) Represent the data in a bar chart. (3 marks)
11. Figure 2 shows a right pyramid whose base is a square of side 10 cm and its slant side is 15 cm long.

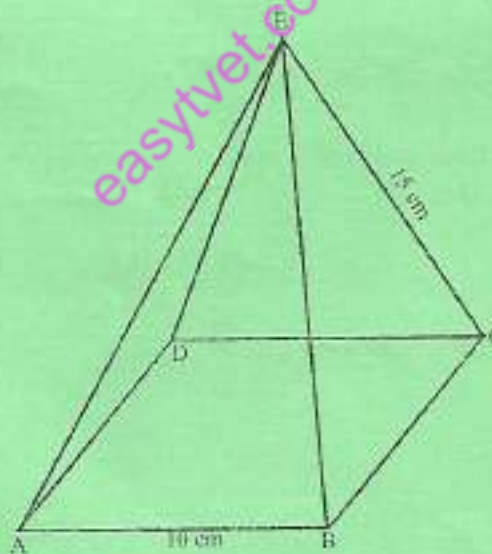


Fig. 2

- (a) Draw the net for the above pyramid. (3 marks)
- (b) Calculate the surface area of the pyramid using the net in (a). (5 marks)

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SECTION B: SCIENCE

PART I (24 marks)

Answer ALL questions from this part.

12. State the **three** modes of heat transfer. (3 marks)
13. List **three** sources of electricity. (3 marks)
14. Outline **three** ways through which a magnet may lose its magnetism. (3 marks)
15. (a) Define an alloy. (1 mark)
- (b) State **two** examples of alloys. (2 marks)
16. State **three** methods that may be used to reduce friction. (3 marks)
17. Define each of the following chemical terms:
- (a) Element. (1 mark)
- (b) Compound. (1 mark)
- (c) Acid. (1 mark)
18. State **three** applications of electrolysis. (3 marks)
19. Figure 3 shows a distance-time graph of a motorist travelling from Town A to Town B. From the graph, determine the:
- (a) Distance that the motorist had covered by 10.30 am. (1 mark)
- (b) Average speed for the whole journey. (2 marks)

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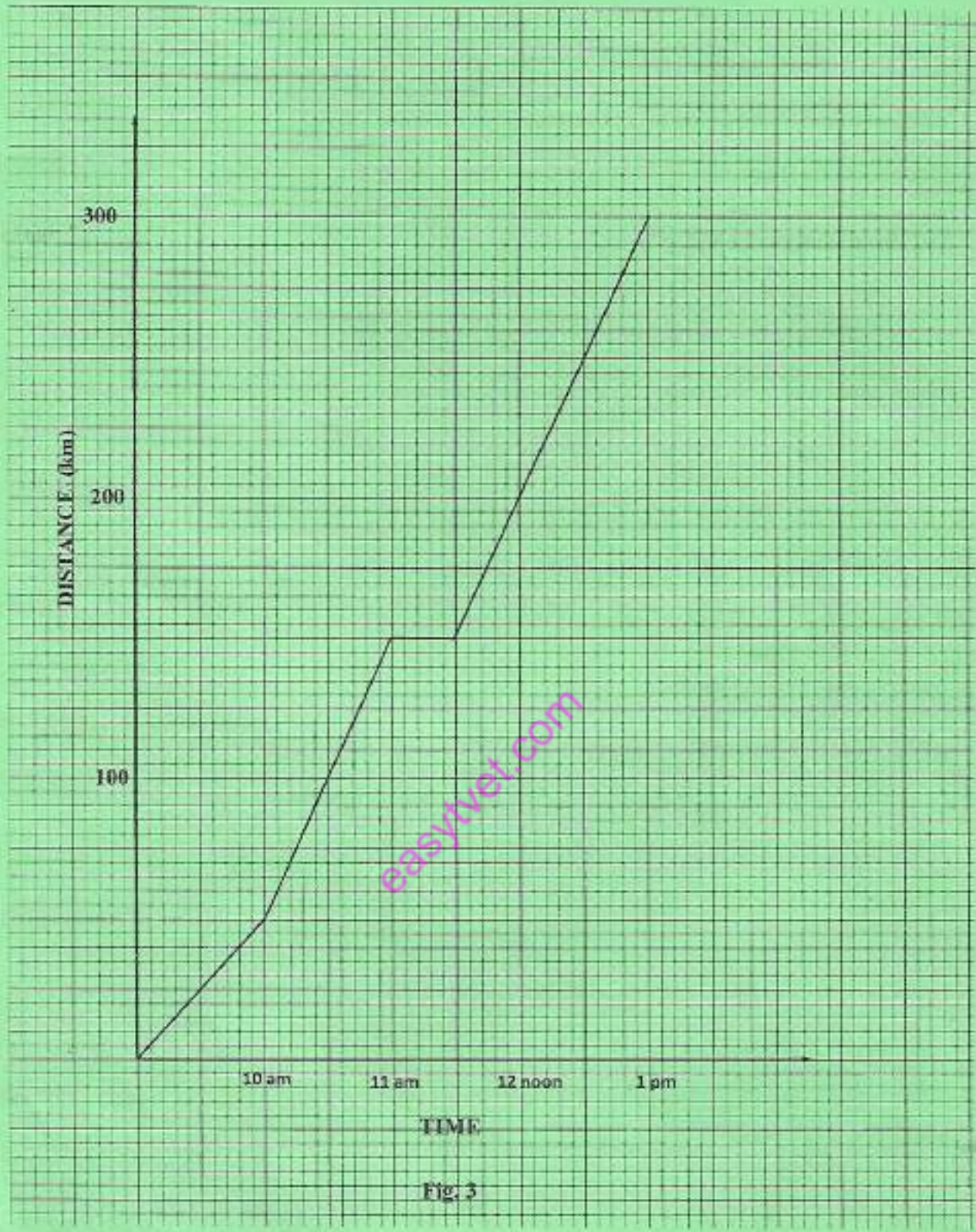


Fig. 3

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PART II (16 marks)

Answer TWO questions from this part.

20. (a) Define moment of force. (2 marks)

(b) Figure 4 shows a uniform metre rule balanced by three masses placed at A, B and C. Determine the weight W placed at C so that the metre rule balances horizontally. (6 marks)

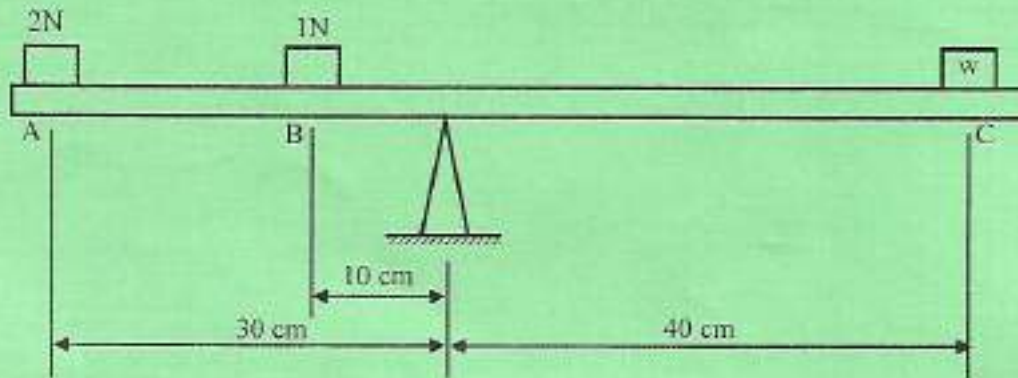


Fig. 4

21. (a) State two copper ores. (2 marks)

(b) A machine is used to lift a mass of 200 kg. If the machine has a velocity ratio of 5 and an efficiency of 80%, calculate the:

- (i) mechanical advantage;
- (ii) effort applied
($g = 10 \text{ N/kg}$)

(6 marks)

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22. (a) State **two** types of curved mirrors. (2 marks)
- (b) Figure 5 shows an object placed between the centre of curvature (c) and the principal focus (f) of a curved mirror.

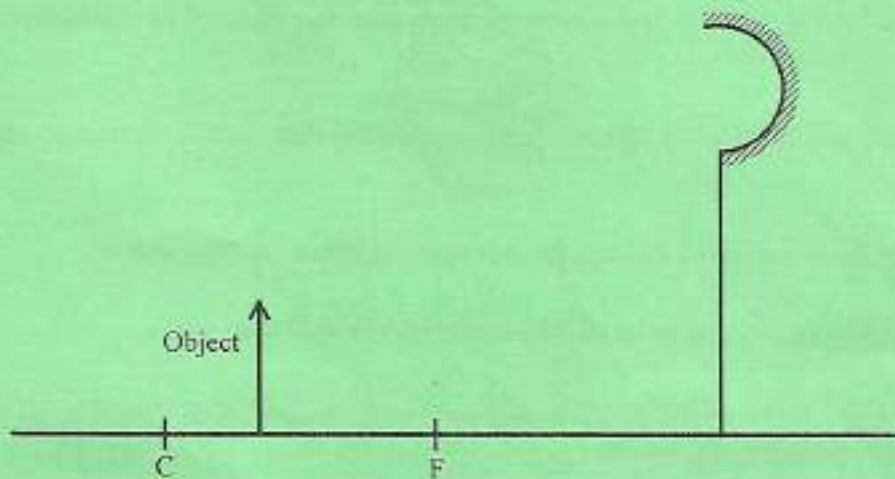


Fig. 5

- (i) Copy and complete the diagram using rays and locate the position of the image.
- (ii) Outline **three** characteristics of the image formed. (6 marks)

SECTION C: GENERAL STUDIES

PART I (20 marks)

Answer **BOTH** questions in Part I.

23. Passo Limited recently donated some equipment to a charitable organization. Assuming that you work at the charitable organization, write a letter of appreciation to the management of Passo Limited. (10 marks)
24. (a) List **four** factors that may influence the choice of a business location. (4 marks)
- (b) State **two** cultural beliefs that may promote overpopulation. (2 marks)
- (c) Outline **two** ways through which a person may save money. (2 marks)
- (d) State **two** duties commonly performed by a mother in a family. (2 marks)

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PART II (20 marks)

Answer any FIVE questions from this part.

25. (a) List **two** types of visual communication that may be used in an organization. (2 marks)
- (b) State **two** barriers to effective communication that may be caused by the sender. (2 marks)
26. (a) List **two** sources of finance for a partnership form of business. (2 marks)
- (b) Outline **two** characteristics of a perfectly competitive market. (2 marks)
27. (a) List **two** types of information that an employee may be required to fill in a form when requesting for permission. (2 marks)
- (b) State **two** effects of good public relations on an organization. (2 marks)
28. (a) Outline **two** factors that may be considered when setting the price of a commodity. (2 marks)
- (b) List **two** methods of sales promotion. (2 marks)
29. (a) State **two** health benefits of engaging in sports. (2 marks)
- (b) Outline **two** ways through which an individual may misuse leisure. (2 marks)
30. (a) State **two** advantages of batch production. (2 marks)
- (b) Outline **two** advantages of making payments by cheque. (2 marks)
31. (a) Outline **two** measures that may be taken to control soil erosion. (2 marks)
- (b) State **two** effects of overpopulation in a country. (2 marks)
32. (a) Outline **two** problems that may arise in an organization as a result of poor budgeting. (2 marks)
- (b) State **two** benefits of using an energy-saving jiko. (2 marks)

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