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SUPPORT SUBJECTS

June/July 2020

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

ARTISAN CERTIFICATE

GENERAL FITTER
MOTOR VEHICLE MECHANICS
AGRICULTURAL MECHANICS
WELDING AND FABRICATION

ELECTRICAL INSTALLATION
CARPENTRY AND JOINERY

PAINTING AND DECORATING
MASONRY
PLUMBING
GARMENT MAKING
FOOD AND BEVERAGE
PRODUCTION AND SERVICE
LEATHER WORK
GENERAL AGRICULTURE

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 from **part II** of section C.*

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 7 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: MATHEMATICS

PART I (24 marks)

Answer ALL the questions in this part.

1. Evaluate $24 \div 3 + 4 \times 5 - 8 \div 4 \times 10 + 1$. (3 marks)
2. The mean height of five girls was found to be 148 cm. When a sixth girl joined the group the mean height was reduced by 3 cm. Determine the height of the sixth girl. (3 marks)
3. Solve for x in the equation:
 $(3^{2x})^2 = 3^4 \times 3^8$. (3 marks)
4. Using mathematical tables, evaluate:

$$\frac{456 \times 398}{271}$$
 (3 marks)
5. Solve for x in the equation:
 $x^2 + 3x - 54 = 0$ (3 marks)
6. A 72 hectare farm is to be shared among three persons (A, B and C) in the ratio 2:3:4. Calculate the size of each share. (3 marks)
7. Dan bought a cow at Ksh 18,000 and sold it at Ksh 21,000. Determine the percentage profit he made. (3 marks)
8. Using mathematical tables, evaluate:

$$\frac{1}{0.125} + \frac{1}{1.25}$$
 (3 marks)

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Answer any TWO questions from this part.

9. Figure 1 shows a sector of a circle. Calculate the area of the shaded region.

(Take $\pi = \frac{22}{7}$)

(8 marks)

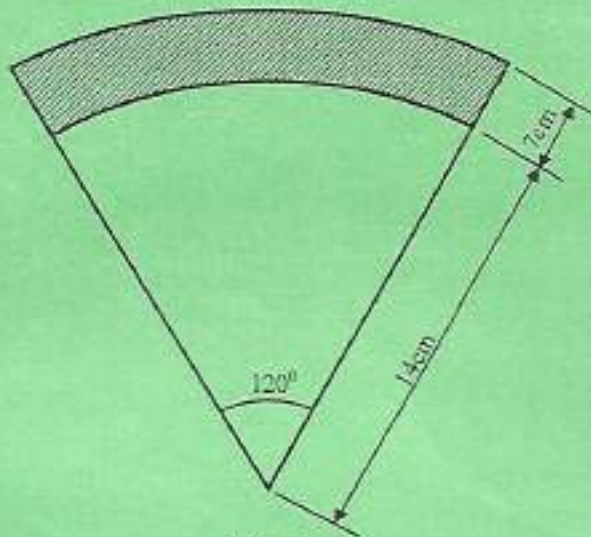


Fig. 1

10. Solve the following set of simultaneous equations:

$$3x + 4y - 18 = 0$$

$$5x + 6y - 28 = 0$$

(8 marks)

11. (a) A cone has a height of 12 cm and the length of its slant side is 13 cm . Calculate the diameter of the base.

(5 marks)

- (b) Make g the subject of the formula:

$$T = 2\pi \sqrt{\frac{L}{g}}$$

(3 marks)

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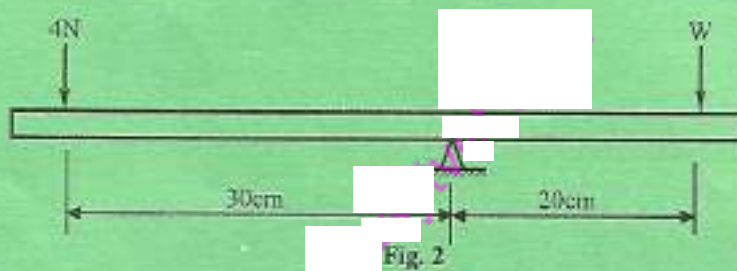
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SECTION B: SCIENCE

PART I: (24 marks)

Answer ALL the questions in this part.

12. State **three** disadvantages of friction. (3 marks)
13. (a) Define an angle of incidence as applied to mirrors. (1 mark)
- (b) State **two** laws of refraction. (2 marks)
14. Outline **three** advantages of secondary cells. (3 marks)
15. A boy stood 200 m from a wall and banged two pieces of wood together. He heard an echo after 1.2 seconds. Calculate the speed of the sound. (3 marks)
16. State **three** effects of a force on a body. (3 marks)
17. (a) State the principle of moments. (1 mark)
- (b) Figure 2 shows a pivoted plank of negligible mass. Calculate the value of W . (2 marks)



18. (a) Define the term pressure. (1 mark)
- (b) State **two** instruments that can be used to measure pressure. (2 marks)
19. (a) Define a scalar quantity. (1 mark)
- (b) The velocity of a particle increases uniformly from 29 m/s to 59 m/s in one minute. Determine the acceleration. (2 marks)

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Answer any TWO questions from this part.

20. (a) Figure 3 shows micrometer screw gauge state its reading. (2 marks)

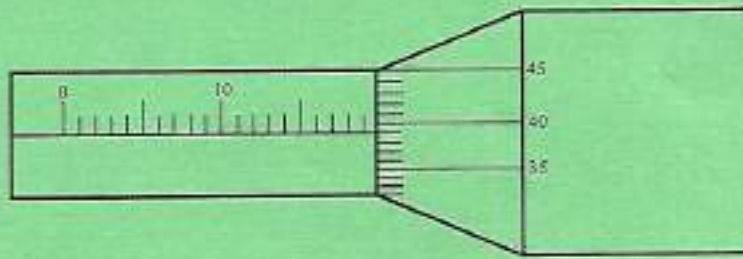


Fig. 3

- (b) Outline the steps that should be followed when using a metre rule to measure the length of a workshop table. (6 marks)

21. (a) Define each of the following in relation to simple machines:

- (i) mechanical advantage;
- (ii) velocity ratio;
- (iii) efficiency.

(3 marks)

- (b) In a machine, a load moves 2 m when the effort moves 8 m. If an effort of 20 N is used to raise a load of 60 N, determine the efficiency of the machine. (5 marks)

22. (a) Figure 4 shows a cross section of a dry cell.

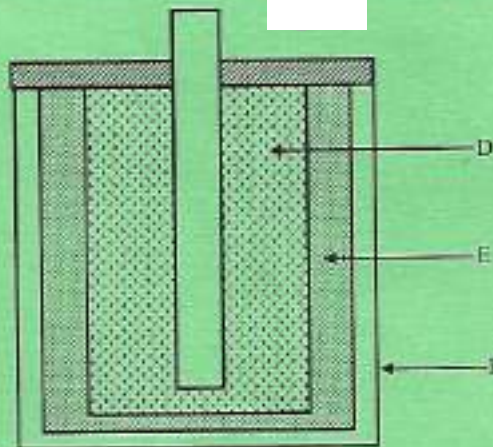


Fig. 4

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- (i) Name the parts labelled D, E and F.
 (ii) State the function of each of the parts named in (i).
 (6 marks)
- (b) A wire of resistance $20\ \Omega$ is connected across a battery of 5 V. Calculate the current in the circuit.
 (2 marks)

SECTION C: GENERAL STUDIES

PART I (20 marks)

Answer **BOTH** questions in this part.

23. Write an essay of about 200 words on the topic 'Benefits that a business may derive from participating in a trade show.'
 (10 marks)
24. (a) Outline **three** situations when verbal communication may be used in an organization.
 (3 marks)
- (b) Classify each of the following costs incurred in a business as either variable cost or fixed cost:
- | | |
|-----------------------------|--|
| (i) rent payments; | |
| (ii) labour costs; | |
| (iii) insurance; | |
| (iv) cost of raw materials; | |
| (v) cost of electricity | |
| (vi) cost of machinery. | |
- (3 marks)
- (c) State **two** advantages of making payments by cash.
 (2 marks)
- (d) Outline **two** functions of the Public Service Commission of Kenya.
 (2 marks)

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PART II (20 marks)

Answer any FIVE questions from this part.

25. (a) List **two** forms of body language that may convey a message. (2 marks)
- (b) State **two** sources of finance for a company. (2 marks)
26. (a) List **two** occasions during which songs were sang in the traditional African communities. (2 marks)
- (b) State **two** positive leisure activities. (2 marks)
27. (a) Outline **two** ways in which parental drug and substance abuse may affect other family members. (2 marks)
- (b) State **two** disadvantages of polygamy. (2 marks)
28. (a) State **two** characteristics of a good speech. (2 marks)
- (b) Outline **two** ways of demonstrating courtesy when making a telephone call. (2 marks)
29. (a) State **two** effects of floods on a country. (2 marks)
- (b) State **two** advantages of using biogas. (2 marks)
30. (a) Outline **two** benefits of maintaining a cashbook in an organization. (2 marks)
- (b) State **two** contributions of savings credit societies to the Kenyan economy. (2 marks)
31. (a) List **two** types of audio-visual communication. (2 marks)
- (b) List **two** types of media through which an organization may advertise its products. (2 marks)
32. (a) State **two** roles played by the Teachers Service Commission (TSC) in Kenya. (2 marks)
- (b) Outline **two** effects of deforestation on a country. (2 marks)

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