

0101/215 0304/215
0103/215 0305/215
0105/215 0401/215
0106/215 0402/215
0202/215 0404/215
0301/215 0405/215
0302/215

SUPPORT SUBJECTS

June/July 2022

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/Scientific calculator;

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 the questions in this part.

1. Evaluate $\frac{12 \div (-3) \times 4 - (-20)}{-6 \times 6 \div 3 + (-6)}$ (3 marks)

2. Solve for x in the equation $\frac{81^{2x} \times 27^x}{9^x} = 729$ (3 marks)

3. Baka bought four pencils and six pens for Kshs 66. Hellen bought two pencils and five pens for Ksh 51. Calculate the price of each item. (3 marks)

4. Using mathematical tables, evaluate $\frac{1}{24.6} + 4.35^2$ (3 marks)

5. Using mathematical tables, evaluate $\frac{4.56 \times 0.38}{0.82}$ and leave your answer in standard form. (3 marks)

6. Solve for x in the equation $2x^2 + x - 36 = 0$. (3 marks)

7. Make n the subject of the formula $\frac{r}{p} = \frac{m}{\sqrt{n-1}}$ (3 marks)

8. A shopkeeper made a loss of 30% by selling an electric iron box at Ksh 700. What profit would the shopkeeper have made if he sold the iron box at Ksh 1150. (3 marks)

$$\frac{30}{100} \times 700 = 210$$
$$1150 - 210 = 940$$

| | | | |
|----------|----------|----------|---|
| 0101/215 | 0202/215 | 0305/215 | 2 |
| 0103/215 | 0301/215 | 0401/215 | |
| 0105/215 | 0302/215 | 0402/215 | |
| 0106/215 | 0304/215 | 0404/215 | |
| | | 0405/215 | |

- (b) Calculate the height of the pyramid. (3 marks)
- (c) Calculate the total surface area of the pyramid. (3 marks)
11. Amos cycled from his home to a school 6 km away in 20 minutes. He stopped at the school for 5 minutes before taking a vehicle to a town 40 km away. The vehicle travelled at 75 km/hr. Draw a distance time graph to represent Amos' journey. (8 marks)

SECTION B: SCIENCE

PART I (24 marks)

Answer *ALL* questions from this part.

12. State **three** methods that can be used to magnetise a steel rod. (2 marks)
13. (a) Figure 2 shows a section of a vernier callipers scale. Determine the reading on the scale in mm. (1 mark)

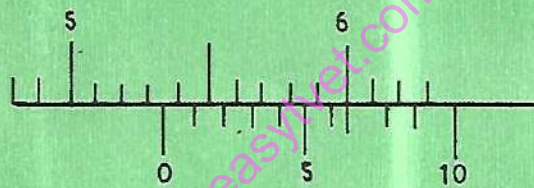


Fig.2

- (b) State **two** measurements that can be taken using vernier callipers. (2 marks)
14. (a) Define friction. (1 mark)
- (b) State **two** factors that determine the amount of friction between two surfaces. (2 marks)
15. With the aid of a diagram, explain regular reflection of light. (3 marks)
16. State **two** factors that affect the velocity of sound in air. (2 marks)

| | | | |
|----------|----------|----------|---|
| 0101/215 | 0202/215 | 0305/215 | 4 |
| 0103/215 | 0301/215 | 0401/215 | |
| 0105/215 | 0302/215 | 0402/215 | |
| 0106/215 | 0304/215 | 0404/215 | |
| | | 0405/215 | |

PART II (16 marks)

Answer any **TWO** questions from this part.

20. (a) Define power and state its SI unit. (2 marks)
- (b) An electric motor rated at 2500 W is used to lift cartons of nails in a store. A single carton has a mass of 5 kg. If the store is 4 m above the ground, determine the number of cartons that the motor can raise in 2 minutes. (Take $g = 10 \text{ N/kg}$) (6 marks)
21. (a) Differentiate between effort and load as used in simple machines. (2 marks)
- (b) An effort of 125 N is used to lift a load of 500 N through a height of 2.5 m. If the distance moved by the effort is 15 m. Calculate the efficiency of the simple machine. (6 marks)
22. (a) Figure 4 shows a simple electric circuit connecting three identical bulbs: B_1 , B_2 and B_3 .

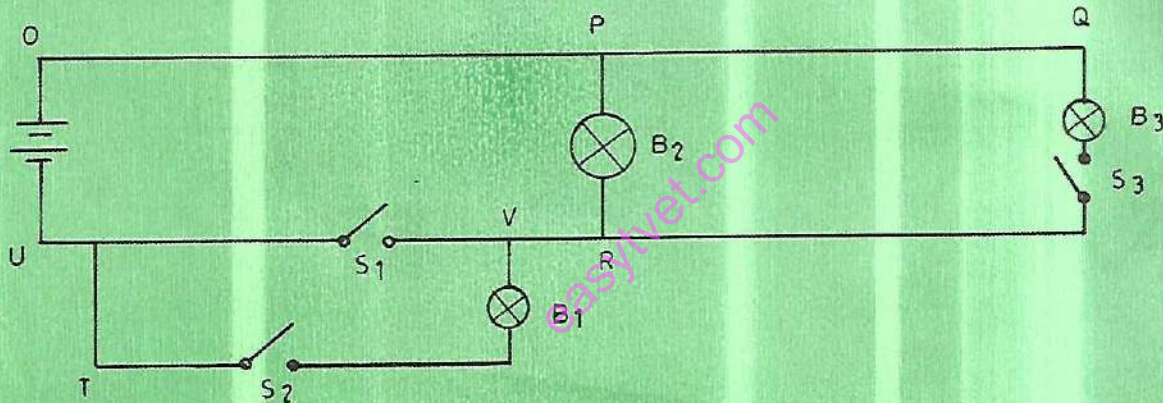


Fig.4

Explain the effect of each of the following indicating the path of current.

- (i) S_1 is closed;
- (ii) S_2 and S_3 are closed. (6 marks)
- (b) A current of 3 mA flows through a conductor of $4\text{K}\Omega$. Calculate the voltage across the conductor. (2 marks)

| | | | |
|----------|----------|----------|---|
| 0101/215 | 0202/215 | 0305/215 | 6 |
| 0103/215 | 0301/215 | 0401/215 | |
| 0105/215 | 0302/215 | 0402/215 | |
| 0106/215 | 0304/215 | 0404/215 | |
| | | 0405/215 | |

PART II (20 marks)

Answer any FIVE questions from this part.

25. (a) List **two** types of non-verbal communication. (2 marks)
- (b) Fill in the blank spaces in each of the following sentences by choosing the correct word from those provided in brackets.
- (i) _____ the news on at five or six? (is, Are)
- (ii) The players, as well as the Captain _____ to win. (want, wants) (2 marks)
- ~~26.~~ (a) State **two** advantages of the nuclear family. (2 marks)
- (b) List **two** social services that are negatively affected by overpopulation. (2 marks)
- ~~27.~~ (a) State **two** legislative measures that have been put in place to control pollution in Kenya. (2 marks)
- (b) List **two** roles of trade unions in Kenya. (2 marks)
- ~~28.~~ (a) List **two** passive leisure activities that the youth may engage in. (2 marks)
- (b) State **two** circumstances under which songs were sang in the Traditional African Society. (2 marks)
- ~~29.~~ (a) List **two** external publics of a business enterprise. (2 marks)
- (b) State **two** ways in which an individual can demonstrate neatness when filling an official form. (2 marks)
- ~~30.~~ (a) List **two** indicators of an unsuitable business location. (2 marks)
- (b) List **two** types of fixed costs incurred in a business enterprise. (2 marks)
- ~~31.~~ (a) State **two** advantages of saving through a savings and credit society. (2 marks)
- (b) List **two** services that commercial banks offer to business enterprises. (2 marks)
- ~~32.~~ (a) List **two** details that should be contained in a valid cheque. (2 marks)
- (b) State **two** methods that can be used to promote sales in a business enterprises. (2 marks)

THIS IS THE LAST PRINTED PAGE.

| | | | |
|----------|----------|----------|---|
| 0101/215 | 0202/215 | 0305/215 | 8 |
| 0103/215 | 0301/215 | 0401/215 | |
| 0105/215 | 0302/215 | 0402/215 | |
| 0106/215 | 0304/215 | 0404/215 | |
| | | 0405/215 | |

June/July 2022