

0101/215            0304/215  
0103/215            0305/215  
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0302/215

**SUPPORT SUBJECTS**

Oct./Nov. 2010

Time: 3 hours



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**ARTISAN CERTIFICATE**

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

**SUPPORT SUBJECTS**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Three answer booklets;*

*Mathematical tables;*

*Drawing instruments.*

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

*Answers to **ALL** the three sections **A, B and C** must be provided in separate answer booklets.*

*Candidates are advised not to spend more than **one hour** in each section.*

**SECTION A: MATHEMATICS** (part I and part II)

**SECTION B: SCIENCE** (part I and part II)

**SECTION C: GENERAL STUDIES** (part I and part II)

**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: MATHEMATICS

## PART I: (24 marks)

Answer all the questions from this section.

1. Simplify the following expression:

$$3q - 3 - (1 + q) + 1 - q - \frac{1}{q}$$

(2 marks)

2. Find the sum of a third of  $(a + b)$  and a fifth of  $(a - b)$ .

(2 marks)

3. Evaluate:

$$3\frac{7}{8} + \sqrt{\left(\frac{3\frac{7}{8} \div 7\frac{3}{4}}{5\frac{1}{10} + 2\frac{9}{10}}\right)}$$

(3 marks)

4. Three-fifth of work is done on the first day. On the second day,  $\frac{3}{4}$  of the remainder is completed.

If on the third day  $\frac{7}{8}$  of what remained is done, what fraction of work still remains to be done?

(4 marks)

5. Find the length of a square whose area is  $0.0084 \text{ m}^2$ .

(1 marks)

6. A rectangle which is three times as long as it is wide has the same perimeter as a square of area  $64 \text{ cm}^2$ . What is the length of the rectangle?

(3 marks)

7. Peter, Ali and John shared the profit of their business in the ratio 3:7:9 respectively. If Peter received, Kshs.60,000. How much profit did the business yield?

(2 marks)

8. A farmer takes 8 days to cultivate a plot of land  $2\frac{1}{2}$  ha in area. What area of land will he cultivate in 20 days working at the same rate?

(2 marks)

9. A trader marked a pair of shoes at sh.1400. She sold the pair at a discount of 10% and still made a profit of 25% on the cost price.

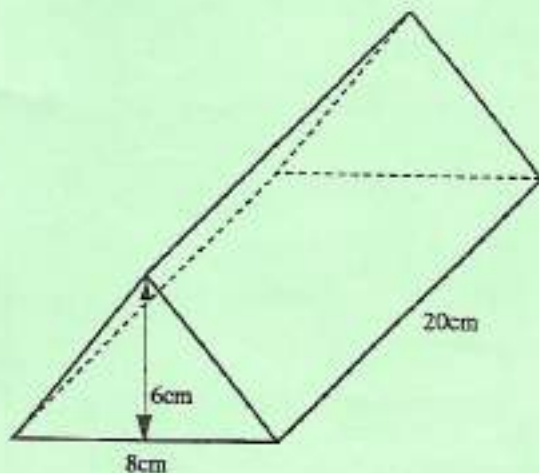
Determine how much the trader had paid for the pair of shoes.

(4 marks)

**PART II: (16 marks)**

*Answer any two questions from this section.*

10. (a) A sheep costs kshs.p and a goat costs ksh.q less than a sheep. Find in terms of p and q the cost of 3 sheep and 2 goats. (3 marks)
- (b) The depth of a swimming pool increases uniformly from 0.5m at the shallow end to 2m at the deep end. If the pool is 20m long and 8m wide, how many litres of water are required to fill it? (4 marks)
- (c) The enrolment of Wengi Primary School was 1283 pupils last year. The enrolment this year is 109% of last year's. What is this year's enrolment? (1 mark)
11. (a) A tap empties a tank containing 273 litres of water. If the water flows at a rate of  $6\frac{1}{2}$  litres per minutes, how long does it take to empty the tank? (3 marks)
- (b) A man bought a piece of land for ksh.256,000. Five years later when its value had appreciated by 20% he decided to sell it. If the buyer paid a deposit of 10%, how much remained to be paid? (3 marks)
- (c) Three tractors each working 8 hours a day can plough a field in 5 days. How many days would 2 such tractors working 10 hours a day take to plough the same field? (2 marks)
12. (a) Three girls, Rose, Doreen and Pauline together scored 207 marks in a test. The ratios of their marks were:  
Rose to Doreen 3:2 and Doreen to Pauline 6:8.  
How many marks did each girl score? (3 marks)
- (b) The figure below is a structure of a mixture of two metals. If the mass of the structure is 450g, calculate the density of the mixture of the metals. (5 marks)



**SECTION B :SCIENCE**  
**PART I: (24 marks)**

*Answer ALL questions from this section.*

13. Define the following terms:

- (i) boiling point;
- (ii) melting point;
- (iii) PH scale.

(3 marks)

14. Name **three** physical properties of bases.

(3 marks)

15. Give **three** ways in which bases can be used.

(3 marks)

16. State whether the solutions which have the following PH values are acidic, basic or neutral.

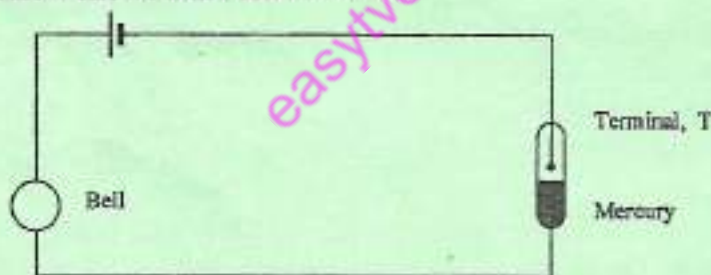
PH = 8, PH = 6, and PH = 7.

Which of the PH values listed above is

- (i) a weak base?
- (ii) a weak acid?
- (iii) a neutral solution?

(3 marks)

17. The figure below shows a fire alarm circuit.



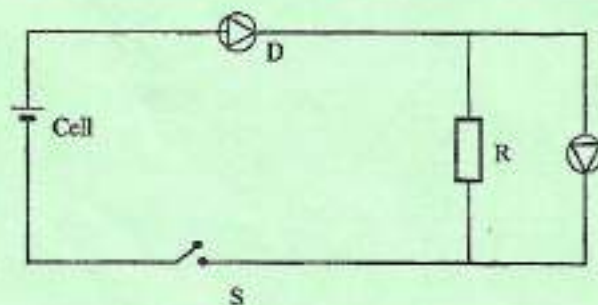
Explain how the alarm works.

(3 marks)

18. State **two** factors that would raise the boiling point of water to above 100°C.

(2 marks)

19. In the circuit below, when the switch S is closed, the voltmeter shows a reading.



When the cell terminals are reversed and the switch is closed, the voltmeter reading is zero.  
Explain these observations. (3 marks)

20. An industrial trolley of mass 20kg carrying a mass of 50kg is acted on by a constant force. The trolley moves along a horizontal smooth surface with an acceleration of  $0.5\text{ms}^{-2}$ . Determine the acceleration of the trolley after the mass falls off. (3 marks)

21. What is meant by sublimation? (1 marks)

**PART II: (16 marks)**

*Answer any two questions from this section.*

22. (a) State Newton's second law of motion. (1 mark)

(b) A matatu starts from rest and accelerates to cover a distance of 49m in 7 seconds. Determine its:-

(i) acceleration; (3 marks)

(ii) velocity after 7 seconds. (2 marks)

(c) A trolley moving on a horizontal bench of height 1.2m, strikes a barrier at the edge of the bench. The brass mass on the top of the trolley flies off on impact and lands on the ground 2.5m from the edge of the bench. Determine the time taken by the brass mass to reach the ground. (2 marks)

23. (a) With the aid of a well labelled diagram show the presence of carbon dioxide and water in air. (4 marks)

(b) What changes are observed in lime water when air is bubbled through it? (2 marks)

(c) What changes are observed when anhydrous copper (II) sulphate is left in air overnight? Explain. (2 marks)

24. (a) State how the following bonds are formed. (2 marks)

(i) ionic; (2 marks)

(ii) covalent; (2 marks)

(iii) coordinate. (2 marks)

- (b) State the type of bond one would expect to find in,  $H_2SO_4$ .

(2 marks)

### SECTION C: GENERAL STUDIES

#### PART I: (20 marks)

*Both questions in Section C are compulsory.*

25. Read the following passage and answer the questions that follow:

There are many causes of malnutrition but the most common cause is poverty where households cannot afford to pay for proper nutrition. The nutritional status of a person depends on the food they have eaten, their overall health and physical environment.

Malnutrition results when a person does not receive nutrients due to lack of food, absorption problems or excess loss of nutrients. It also occurs where there is overconsumption of nutrients.

Poor nourishment weakens the immune system, impairs physical and mental health, saps energy, stunts growth and development and increases the risk of contracting infectious diseases.

When children are exposed to prolonged starvation their bodies begin to consume their own tissues to obtain needed nutrients and energy. Unfortunately for infants and young children, the effects of chronic malnutrition weaken resistance and increase a child's risk of dying from pneumonia, diarrhoea and malaria. It is therefore important to address the long-term challenges of poverty and malnutrition.

- (a) Explain the meaning of the following words as used in the passage. (2 marks)
- (i) malnutrition;
  - (ii) stunts;
  - (iii) impairs;
  - (iv) nourishment.
- (b) Outline **four** causes of malnutrition. (4 marks)
- (c) List **three** health complications that may cause death to infants after malnutrition. (3 marks)
- (d) Name **two** effects of poor nourishment. (1 mark)

- (e) Highlight **five** importances of minerals. (5 marks)
- (f) List **five** sources of government revenue. (5 marks)

**PART II: (20 marks)**

*Answer any five questions from this section.*

26. *Identify and correct the misspelt words in clause below:* (4 marks)

Alcohol intake is harmful to ones healthy. When one gets drank he might spend a lot of money. One's behaviour becomes unworth and may lead to early death. Our bodies need energy builting foods.

27. (a) Define a sole proprietorship. (1 mark)
- (b) List **three** advantages of a sole proprietorship. (3 marks)

28. Highlight the role of the Kenya Bureau of Standard. (4 marks)

29. (a) State **two** causes of prostitution in the modern society. (2 marks)
- (b) Outline ways of curbing homosexuality in the society. (2 marks)

30. Mrs. Kwikwi owns the following in business:

Fixed assets	=	300,000
Current assets	=	50,000
Current liabilities	=	30,000
Profit for the current year	=	20,000

Calculate the rate of return on capital employed.

(4 marks)

31. (a) State **two** ways in which a person can maintain body fitness. (2 marks)
- (b) Outline the role of Red Cross Society in our country. (2 marks)

32. (a) Highlight advantages of manual water pumps. (2 marks)
- (b) State alternatives of using gas for cooking. (2 marks)
33. Define the duties of the following in our country:
- (i) member of parliament; (2 marks)
- (ii) minister. (2 marks)

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