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Candidate's Signature: _____

Date: _____



SUPPORT SUBJECTS
Oct./ Nov. 2013
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 TECHNOLOGY
GENERAL AGRICULTURE**

SUPPORT SUBJECTS

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.

Sign and write the date of examination in the spaces provided above.

You should have the following for this examination:

Drawing instruments;

Mathematical tables/ Scientific calculator.

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

Answers to **ALL** the questions should be written in the spaces provided in this question paper.

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

Do **NOT** remove any pages from this booklet.

Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Marks	Candidate's Score
A		40	
B		40	
C		40	
TOTAL SCORE		120	

This paper consists of 16 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. Simplify:

$$\frac{5\frac{1}{4} \div 2\frac{4}{5}}{3\frac{3}{4}}$$

(3 marks)

✓ 2. Solve the equation:

$$\frac{4b + 13}{4} - \frac{2b + 2}{3} = 2 + \frac{2b + 3}{8}$$

(3 marks)

✗ 3. 15 men repaired a playing field in 10 days, working for 8 hours a day. If 12 men had to complete the same job in 12 days, for how many hours a day would they have had to work?

(3 marks)

✓ 4. Given amount A = ksh 319383.75 and the interest is 15% per annum, find the principle amount if the interest period is 3 years.

(3 marks)

✓ 5. Use factors method to find the roots of $2x^2 + 4x - 6 = 0$.

(3 marks)

✗ 6.

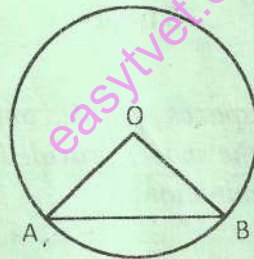


Fig. 1

In figure 1, $\angle AOB = 80^\circ$ and $OA = 10.5$ cm. Calculate the length of chord AB.

(3 marks)

✗ 7. The slanting edge of a cone is 17 cm. If the diameter of the cone is 16 cm, calculate the volume of the cone.

(3 marks)

✓ 8. Convert 504 km/h into metres per second.

(3 marks)

(PART II - 16 marks)

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

9. Table 1 represents speeds for different matatus on a certain highway.

Speed	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89
Number of matatus	1	3	2	4	10	5	6	2

Table 1

From table 1, state the modal class and determine the:

- (i) median;
- (ii) mean.

(8 marks)

✓ 10. Mama Sharon went to the market and bought five tins of beans and two tins of maize at ksh 1300. Had she bought three tins of beans and four tins of maize, she would have paid ksh 1200. Calculate the prize of one tin of beans and one tin of maize.

(8 marks)

X 11. Robert takes a train for two-thirds of his journey, a bus for seven-eighths of the remainder and the rest he walks. If his bus journey is 3 km longer than he walks, how long was his complete journey?

(8 marks)

SECTION B: SCIENCE (PART I - 24 marks)

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

12. (a) Define the term power. ✓ (1 mark)

(b) A boy pulls a trolley through a distance of 25 m by means of a rope inclined 30° to the horizontal. If the force applied to the rope is 100 N, calculate the work done by the boy. (2 marks)

13. State any **three** properties of the image in a plane mirror. (3 marks)

14. A dry cell is able to supply a current of 0.25 A to a load of 4.5 ohms. If the e.m.f of the cell is 2 volts, determine the internal resistance of the dry cell. (3 marks)

15. A beam of wood is 20 metres long. A load of 25 kg is placed 7.2 metres from the pivot. If another load is placed 4.8 metres on the other side of the pivot, determine the mass of the load that will enable the beam to balance. (3 marks)

16. Show with the aid of an electric circuit diagram, how electromotive force, current and potential difference are measured. (3 marks)

17. (a) State **one** area where sound is not active. (1 mark)
- (b) A tuning fork has a frequency of 600 Hz. Calculate the wave-length of the sound waves if the speed of sound is 330 m/s. (2 marks)
18. Name any **three** methods of magnetising a magnetic material. (3 marks)
19. State the composition of each of the following alloys:
- (a) steel;
- (b) brass;
- (c) bronze. (3 marks)

(PART II - 16 marks)

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

20. (a) Define the term velocity ratio of a simple machine. (2 marks)
- (b) A machine of velocity ratio 60 overcomes a load of 6500 N when an effort of 125 N is applied. Determine the:
- (i) mechanical advantage of the machine;
- (ii) efficiency of the machine;
- (iii) percentage of work done against friction. (6 marks)
21. (a) Name the process by which heat transfers from the burning charcoal in a jiko to:
- (i) the water in a sufuria kept on it;
- (ii) a person sitting in front of it. (3 marks)
- (b) Water at a room temperature of 20° C is heated by an immersion heater of 2000 watts in ten minutes. If the final temperature of the water is 100° C, calculate the mass of the water. (Specific heat capacity of water = 4200 j(kgK). (5 marks)
22. (a) With the aid of a labelled diagram, show the laboratory preparation of oxygen gas. (4 marks)
- (b) State any **two** physical and any two chemical properties of oxygen gas. (4 marks)

SECTION C (PART I - 20 marks)

All questions in part I of section C are compulsory.

23. (a) List down any **two** factors that influence the choice of communication method. (1 mark)
speed
choice
- (b) Rewrite the following sentences correctly: (3 marks)
- (i) Jane told Daniel to wait him at the gate.
 - (ii) These boys they are very hardworking.
 - (iii) Susan's head injury is more worse than Jacque's leg injury.
 - (iv) He was accused for lying.
 - (v) When is he leaving to England?
 - (vi) He did his best to comply to the requirement.
24. Fill in the blanks with one of the adjectives in brackets: (2 marks)
- (a) Is that the _____ edition of the Times? (Last, latest)
 - (b) A prize was given to _____ one of the best pupils. (Each, every)
 - (c) Who is the college's new _____?(Principle, principal)
 - (d) My uncle has been suffering from _____ for the last two weeks. (Diarrhoea, diarhoea, dierhoea)
25. Combine each of the following sentences using "since", "although", "because" or "and". (2 marks)
- (a) Henricah was tired. She had walked for three hours.
 - (b) Mitch went to school. He completed all his assignment.
 - (c) Jonh's cousin was physically handicapped. John's cousin was very intelligent.
 - (d) Her father died. She has never felt secure.
26. You are the secretary of the students' council in your institution. Write a notice informing the students of a meeting. (8 marks)

27. Mention any **four** environmental hazards and for each, suggest a control measure. (4 marks)

(PART II - 20 marks)

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

28. (a) Point out giving examples, the **two** basic causes of soil erosion. (2 marks)

(b) Explain any **two** effects of soil erosion. (2 marks)

29. List any **four** purposes of book-keeping. (4 marks)

30. Define the term "budget". (4 marks)

31. Explain any **four** advantages of budgeting. (4 marks)

32. Explain any **four** ways of raising business capital. (4 marks)

33. Suggest any **four** ways through which an entrepreneur can promote sales. (4 marks)

34. (a) Point out any **two** importance of science and technology in National development. (2 marks)

(b) List any **two** modern types of appropriate technologies. (2 marks)