

ARTISAN

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SUPPORT SUBJECTS

Oct./Nov. 2021

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

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.*

Candidates should answer the questions in English.

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 in this part.

- Evaluate $\frac{28 - (-18)}{-2} - \frac{15 - 1(-2)(-6)}{3}$. (3 marks)
- Using mathematical tables, evaluate $\frac{\sqrt{0.0625}}{0.342}$. (3 marks)
- Three business men Alex, Ben and Joel contributed a total amount of Ksh 120,000 to start a business. The ratio of the contributions of Alex and Ben was 2:3 and that of Ben to Joel was 2:5. Determine the amount that Joel contributed. (3 marks)
- Without using mathematical tables, evaluate $\frac{0.18 \times 4}{\sqrt{3.24 \times 4}}$. (3 marks)
- Figure 1 shows a plate.

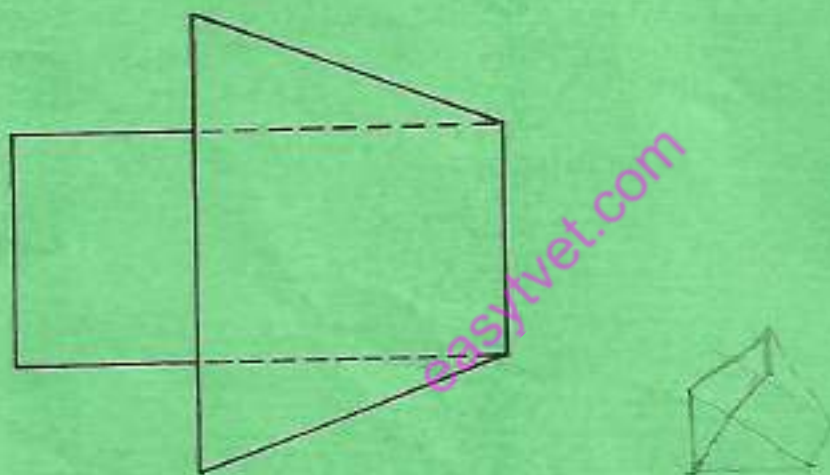


Fig.1

Draw the shape of the plate when folded showing the hidden edges with broken lines. (3 marks)

- A farmer deposited Ksh 45,000 in a bank which paid a simple interest of 12% per annum. Calculate the amount after 2 years. (3 marks)

$$\left(\frac{45000 \times 12 \times 2}{100} \right)$$

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7. Solve for x in the equation:

$$\frac{x+3}{24} = \frac{1}{x-2} \quad (3 \text{ marks})$$

8. Given that $\sin \theta = \frac{5}{13}$, without using mathematical tables, determine:

(a) $\cos \theta$; (2 marks)

(b) $\tan \theta$. (1 mark)

PART II (16 marks)

Answer any TWO questions from this part.

9. Pauline deposited Ksh 1,500 in a savings account at the beginning of the year. Compound interest on the money is calculated at the rate of 15% per annum. At the beginning of each subsequent year, she deposited Ksh 1,500 in the same account. Calculate the amount in the account at the end of the fifth year. (8 marks)
10. The weights in kg of children visiting a clinic on a certain day were recorded as follows:

3	7	9	9	20	14	10	6	8	13
14	3	17	13	8	12	5	15	14	15
7	12	11	6	10	19	9	14	6	9
10	16	13	9	12	11	10	7	10	11

- (a) Calculate the range. (1 mark)
- (b) Using a class width of 3, represent the data in a frequency distribution table. (4 marks)
- (c) Calculate the mean weight of the children. (2 marks)
- (d) State the modal class. (1 mark)

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11. Figure 2 shows a velocity - time graph for a vehicle moving between two points located 825 m apart.

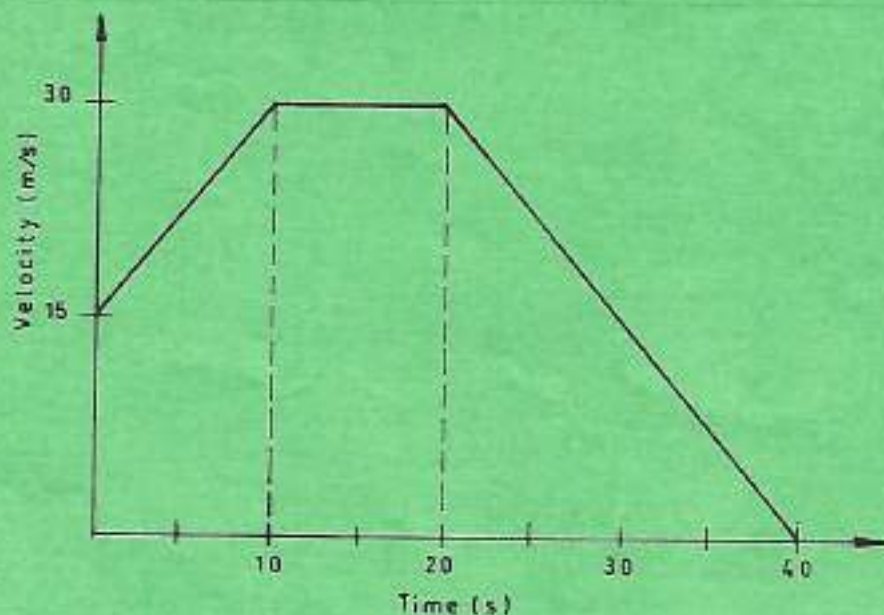


Fig. 2

- (a) What is the maximum speed attained by the vehicle? (1 mark)
- (b) Calculate the average velocity of the vehicle for the:
- (i) whole journey;
 - (ii) first 10 seconds.
- (3 marks)
- (c) Calculate the acceleration of the vehicle in the:
- (i) first 10 seconds;
 - (ii) last 20 seconds.
- (4 marks)

SECTION B: SCIENCE

if its affordable

PART I (24 marks)

the rule is law Making
Equally registration

Answer ALL questions in this part.

to give justice to people

12. (a) State two forms of energy. if liter it and so see what is (2 marks)
- (b) State the SI unit of work. joule m (1 mark)
13. State three properties of images formed by plane mirrors. the L.O Y.O.S (1 mark)
14. (a) Define echo. foot ball landing (1 mark)
- (b) A person standing 49.5 m from the foot of a tall cliff claps the hands and hears an echo 0.3 seconds later. Calculate the speed of sound in air. (3 marks)
15. State three disadvantages of friction. (3 marks)
16. Outline three factors that affect thermal conductivity. (3 marks)
17. (a) Differentiate between magnetic and non-magnetic materials. (2 marks)
- (b) Figure 3 shows two bar magnets close to each other.



causes noise between moving system
loss some work has to be done against
converts to heat and heat

Fig. 3

Copy the figure and draw the magnetic field pattern for the set up. (2 marks)

18. State two forces that act on an object as it moves downwards in a liquid. (2 marks)
19. Distinguish between scalar quantity and vector quantity. (2 marks)



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PART II (16 marks)

Answer any TWO questions from this part.

20. Figure 4 shows the extraction of iron in blast furnace.

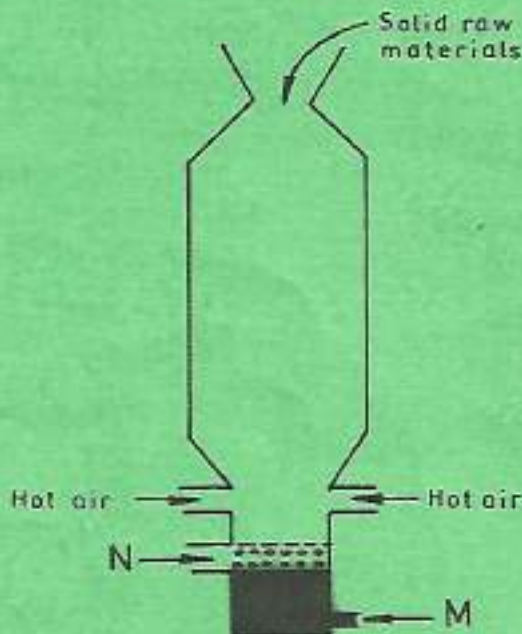


Fig.4

- (a) State **three** solid raw materials that are fed into the blast furnace. (3 marks)
- (b) Name the substances labelled M and N. (2 marks)
- (c) Explain the role of hot air in the process of extraction. (1 mark)
- (d) State **two** waste gases that come out of the blast furnace. (2 marks)
21. (a) Define density and state its SI unit. (2 marks)
- (b) State the principle of transmission of pressure in liquids. (1 mark)
- (c) The mass of an empty density bottle is 20 g. Its mass when filled with water is 45 g and 360 g when filled with mercury. Calculate the density of mercury given that the density of water is 1 g/cm^3 . (5 marks)

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22. (a) State two factors that affect the moment of a force. (2 marks)

(b) Figure 5 shows a uniform bar balanced by four forces. Calculate distance 'd'.

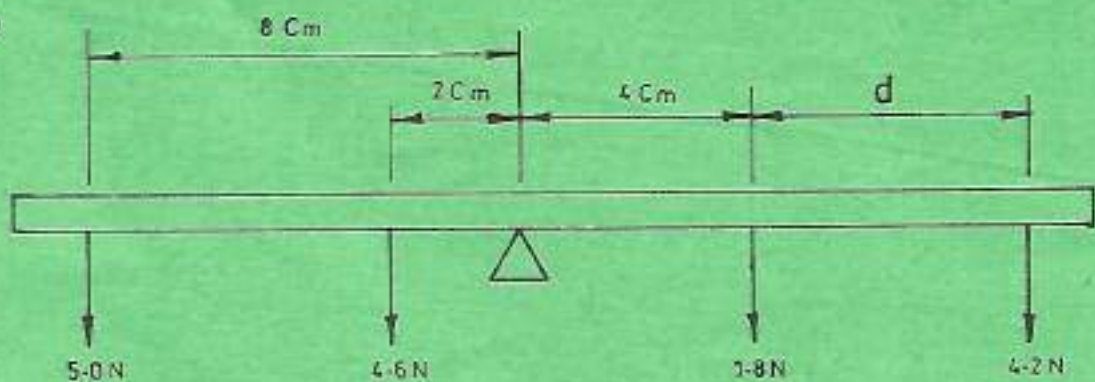


Fig-5

marks)

SECTION C: GENERAL STUDIES

PART I (20 marks)

Both questions in this part are **COMPULSORY**.

23. (a) Pareti Traders intends to design a form to be filled by the visitors of the organization. State six types of information that should be included in the form. (6 marks)

(b) List four types of reports that can be written in an organization. (4 marks)

24. (a) List three items of the top layout of a formal letter. (3 marks)

(b) State two receiver-related factors that determine the choice of a communication medium. (2 marks)

(c) State three measures that may be taken to control population growth in a country. (3 marks)

(d) List two pillars of the Nyayo philosophy of Kenya. (2 marks)

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Turn Over

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heating sand to remove

23 occupation
address
time
sex

24
Signature
address

PART II (20 marks)

Answer any FIVE questions from this part.

25. (a) State **two** limitations of biogas as a source of energy. (2 marks)
(b) State **two** advantages of firewood as a source of energy. (2 marks)
26. (a) State **two** roles of the local government in Kenya. (2 marks)
(b) State **two** functions of the Judiciary in Kenya. (2 marks)
27. (a) State **two** advantages of television as a means of advertisement. (2 marks)
(b) List **two** entries contained in the stock book of an organization. (2 marks)
28. (a) List **two** types of variable costs incurred in a business enterprise. (2 marks)
(b) State **two** contents of an employment contract. (2 marks)
29. (a) List **two** clubs that a college student may join. (2 marks)
(b) State **two** benefits of using leisure time properly. (2 marks)
30. (a) State **two** reasons that make human beings to work. (2 marks)
(b) List **two** roles played by the National Assembly in Kenya. (2 marks)
31. (a) State **two** measures that can be taken to reduce deforestation in Kenya. (2 marks)
(b) State **two** ways in which technological development can help to control pollution. (2 marks)
32. (a) List **two** advantages of a monogamous marriage. (2 marks)
(b) State **two** responsibilities of a mother to her children. (2 marks)

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