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SUPPORT SUBJECTS

Oct./Nov. 2018

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:*

*Three answer booklets;*

*Mathematical tables;*

*Drawing instruments.*

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

*Each section MUST be answered in a separate answer booklet.*

*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. Simplify  $\frac{7 \times 3^4}{3^3 \times 7^2 \times 5^{-2}}$ , expressing the answer with positive indices. (3 marks)
  
2. Express 47 seconds as a percentage of 5 minutes. (2 marks)
  
3. Express  $\frac{12}{17}$  as a decimal correct to 3 significant figures. (2 marks)
  
4. A water tank is 2 m long 75 cm wide and 50 cm high. Determine the:
  - (a) capacity of the tank in litres; (2 marks)
  - (b) wetted area when the tank is  $\frac{3}{4}$  full. (2 marks)
  
5. The length of a rectangular box with square ends is 15 cm greater than the breadth. If the total length of the edges is 2.04 m, determine the dimensions of the box. (4 marks)
  
6. Solve the simultaneous equations:
 
$$2x - y = 4$$

$$x + y = 5$$
(4 marks)
  
7. Make  $G$  the subject of formula in the equation  $v = \frac{K + \frac{4}{3}G}{P}$ . (2 marks)
  
8. Determine the area of the parallelogram shown in Figure 1 if all the dimensions are in millimetres. (3 marks)

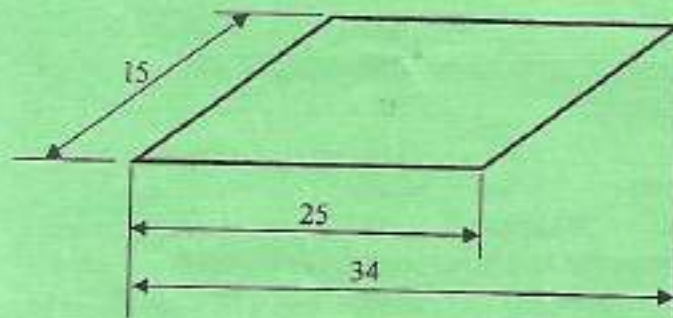


Fig. 1

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13. (a) Define friction.  
 (b) State two causes of friction. (3 marks)
14. With the aid of a sketch, outline the procedure of verifying that sound travels through air. (4 marks)
15. Figure 2 shows the arrangement for lifting a mass of 60 kg through a distance of 4 m on a plane inclined at  $30^\circ$ . Determine the work done. (2 marks)

Take  $g = 10 \text{ m/s}^2$

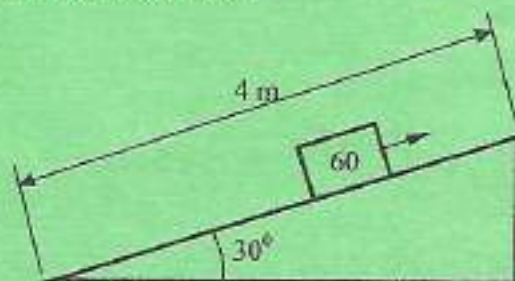


Fig. 2

16. Illustrate the existence of atmospheric pressure. (2 marks)
17. With the aid of a sketch, show that depth affects pressure in liquids. (3 marks)
18. Outline two:  
 (a) uses of electrolysis; (2 marks)  
 (b) features of a dry cell. (2 marks)
19. Explain expansion in solids using the particle theory. (2 marks)
20. Figure 3 shows the magnetic field between two magnets X and Y.



Fig. 3

- (a) State the poles P and Q.  
 (b) State which of the two magnets is stronger and give the reason for your answer. (2 marks)

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## SECTION C: GENERAL STUDIES

### PART I (20 marks)

Answer **BOTH** questions in Part I.

24. Read the passage below and answer the questions that follow.

The influx of **second hand** vehicles into the Kenyan market aims at satisfying transport demands that the local motor vehicle industry is unable to meet. The imports cut across the transport sector ranging from personal to heavy commercial vehicles. This has led to the increase of used vehicle showrooms, with majority doing their own importation.

While buying a vehicle online has been made easy, internet adverts can be very misleading on the **actual** condition of the vehicle. However, before buying a second hand vehicle, there are various factors that one should consider. One such factor is the age of the vehicle. Age determines the condition of the vehicle especially if it is not well maintained. The model of the vehicle should also be considered. This is because some models are more expensive to maintain than others.

In addition, one should consider the value of the vehicle. This is because the value determines the amount of Excise Duty to be paid at the port of entry. Besides, one should consider the engine capacity of the vehicle. A big engine determines fuel consumption of the vehicle and this may make it difficult to maintain.

There are several reasons why people **prefer** second hand vehicles. One of them is that second hand vehicles are relatively cheap. Besides, they are of high quality as they are inspected before the shipping is done. Hence, buying them enables many people to **own** vehicles without much financial strain.

- (a) State the meaning of each of the following words as used in the passage:
- (i) second hand;
  - (ii) actual;
  - (iii) prefer;
  - (iv) own.
- (4 marks)
- (b) State, according to the passage, the factors that should be considered before importing a second hand vehicle.
- (4 marks)

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