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SUPPORT SUBJECTS

June/July 2021 Time: 3 hours



#### THE KENYA NATIONAL EXAMINATIONS COUNCIL

### ARTISAN CERTIFICATE

GENERAL FITTER MASONRY
MOTOR VEHICLE MECHANICS PLUMBING

AGRICULTURAL MECHANICS GARMENT MAKING

WELDING AND FABRICATION FOOD BEVERAGE

PRODUCTION AND SERVICE

ELECTRICAL INSTALLATION CARPENTRY AND JOINERY PAINTING AND DECORATING LEATHER WORK
GENERAL AGRICULTURE

#### 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.

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.

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## SECTION A: MATHEMATICS

### PART I (24 marks)

Answer ALL questions in this part.

Factorise the quadratic expression

$$x^2 - 7x + 10$$
.

(3 marks)

2. Figure 1 shows a right angled triangle.

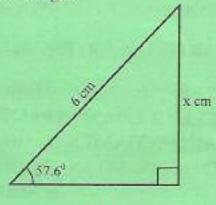


Fig. 1

Use trigonometric ratios to find the value of x.

(3 marks)

- Jane bought a dress at Kshs 3500 and later sold it at Kshs 2800. Determine the percentage loss she incurred. (3 marks)
- 4. Using mathematical tables, evaluate:

$$291 \times 681$$
 $675$ 

(3 marks)

5. Simplify  $\frac{6^3 \times 5^2 \times 4^3}{4^2 \times 5^3 \times 6^5}$ .

(3 marks)

6. Make a the subject of the formula v = u + at.

(3 marks)

7. Determine the area of the sector of a circle of radius 3 cm if the angle subtended at the centre is 140°.  $\left(Take \, \pi = \frac{22}{7}\right)$  (3 marks)

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Convert the recurring decimal 0.73 into a fraction.

(3 marks)

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### PART II (16 marks)

Answer any TWO questions from this part.

- 9. The cost of 4 handkerchiefs and 3 pairs of socks is Kshs.340. If 3 handkerchiefs and 4 pairs of socks cost Kshs.395. Determine the price of each item. (8 marks)
- Table 1 shows the masses of children in a play group. 10.

Table I

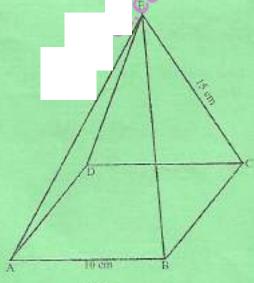
Mass (kg)	35.4	36.8	38.2	40.0	40.2	41.0	41.4
No. of children	-4	3	2	2	2	14	8

- (a) Determine the
  - (i) mean;
  - mode. (ii)

(5 marks)

(b) Represent the data in a bar chart. (3 marks)

Figure 2 shows a right pyramid whose base is a square of side 10 cm and its slant side is 11. 15 cm long.



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Fig. 2

Draw the net for the above pyramid. (a)

(3 marks)

Calculate the surface area of the pyramid using the net in (a). (b)

(5 marks)

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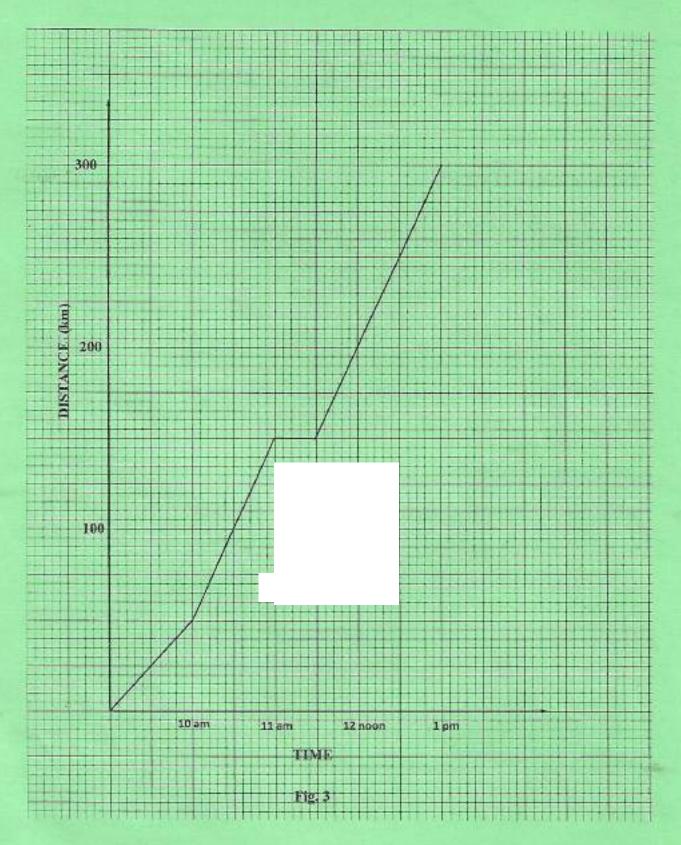
# SECTION B: SCIENCE

### PART I (24 marks)

## Answer ALL questions from this part.

12.	State the three modes of heat transfer.	(3 marks)
13.	List three sources of electricity.	(3 marks)
14.	Outline three ways through which a magnet may lose its magnetism.	(3 marks)
15.	(a) Define an alloy.	(1 mark)
	(b) State two examples of alloys.	(2 marks)
16.	State three methods that may be used to reduce friction.	(3 marks)
17.	Define each of the following chemical terms:	
	(a) Element.	(I mark)
	(b) Compound.	(1 mark)
	(c) Acid.	(1 mark)
18.	State three applications of electrolysis	(3 marks)
19.	Figure 3 shows a distance-time graph of a motorist travelling from Town From the graph, determine the:	A to Town B.
	(a) Distance that the motorist had covered by 10.30 am.	(1 mark)
	(b) Average speed for the whole journey.	(2 marks)

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PART II (16 marks)

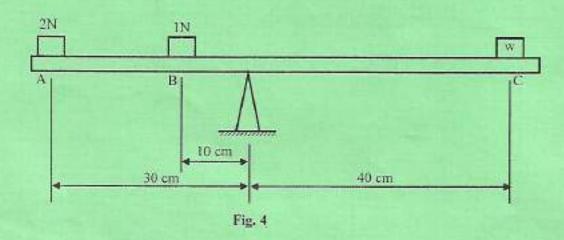
Answer TWO questions from this part.

20. (a) Define moment of force.

(2 marks)

(b) Figure 4 shows a uniform metre rule balanced by three masses placed at A, B and C. Determine the weight W placed at C so that the metre rule balances horizontally.

(6 marks)



21. (a) State two copper ores.

(2 marks)

(b) A machine is used to lift a mass of 200 kg and an efficiency of 80%, calculate the:

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- (i) mechanical advantage;
- (ii) effort applied (g = 10 N/kg)

(6 marks)

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(a) State two types of curved mirrors.

(2 marks)

(b) Figure 5 shows an object placed between the centre of curvature (c) and the principal focus (f) of a curved mirror.

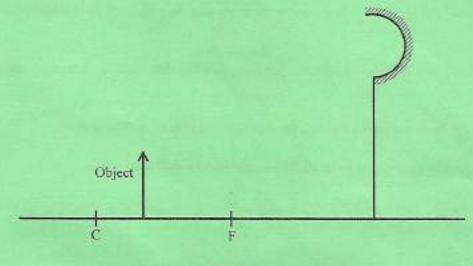


Fig. 5

- (i) Copy and complete the diagram using rays and locate the position of the image.
- Outline three characteristics of the image formed.

(6 marks)

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#### SECTION C: GENERAL STUDIES

PART I (20 marks)

Answer BOTH questions in Part I.

- Passo Limited recently donated some equipment to a charitable organization. Assuming that
  you work at the charitable organization, write a letter of appreciation to the management of
  Passo Limited. (10 marks)
- 24. (a) List four factors that may influence the choice of a business location, (4 marks)
  - (b) State two cultural beliefs that may promote overpopulation. (2 marks)
  - (c) Outline two ways through which a person may save money. (2 marks)
  - (d) State two duties commonly performed by a mother in a family. (2 marks)

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PART II (20 marks)

# Answer any FIVE questions from this part.

25.	(a)	List two types	of visual communication that n	nay be used in an organization.	(2 marks)
	(b)	State two barr	ers to effective communication	that may be caused by the seno	der. (2 marks)
<sup>4</sup> 26.	(a)	List two source	es of finance for a partnership f	form of business.	(2 marks)
	(b)	Outline two cl	aracteristics of a perfectly com	petitive market.	(2 marks)
27.	(a)	List two types requesting for		ee may be required to fill in a fo	orm when (2 marks)
	(b)	State two effe	cts of good public relations on a	an organization.	(2 marks)
				hen setting the price of a comm	nodity.
-28.	(a)	Outline two fa	ctors that may be considered w	men searing the price of a con-	(2 marks)
	(b)	List two meth	ods of sales promotion.		(2 marks)
<sub>~</sub> 29.	(a)	State two hea	th benefits of engaging in sport	IS.	(2 marks)
	(b)	Outline two	ays through which an individu	al may misuse leisure.	(2 marks)
30.	(a)	State two adv	antages of batch production.		(2 marks)
	(b)	Outline two	dvantages of making payments	by cheque.	(2 marks)
31.	(a)	Outline two	neasures that may be taken to c	ontrol soil erosion.	(2 marks)
	(b)	State two eff	ects of overpopulation in a com	ntry.	(2 marks)
32,	(a)	Outline two	problems that may arise in an or	rganization as a result of poor b	oudgeting (2 marks)
	(b)	State two be	nefits of using an energy-saving	; jiko.	(2 marks)
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