

SECTION I: (50MARKS)

Answer all questions in this section

1. Without using a calculator; evaluate (3
 $\frac{-2(5+3) - 9 \div 3}{3+5}$
mks)
 $-3 \times -5 + (2) \times 4$

2. The length and width of a triangle measured to the nearest millimeter are 7.5cm and 5.2 respectively. Find to four significant figures, the percentage error in the area of the rectangle. (3 mks)

3. Simplify (3mks)
 $\frac{4}{\sqrt{5} + \sqrt{2}} - \frac{3}{\sqrt{5} - \sqrt{2}}$

4. The length of a flower garden is 2m less than twice its width. The area of the garden is 60m^2 . Calculate its length.

(3 mks)

5. The height in centimeters of 100 tree seedlings are shown in the table below.

Height (cm)	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69
Number of seedlings	9	16	19	26	20	10

Find the quartile deviation of heights
(4 mks)

(4

6. A straight line l passes through the point $(3, -2)$ and is perpendicular to a line whose equation is

$$2y - 4x = 1.$$

Find the equation of l in the form $y = mx + c$, where m and c are constants.

(3 mks)

7. A bus left a petrol station at 9.20 am and travelled at an average speed 75km/h to a town N. At 9.40 am a taxi, traveling at an average speed of 95km/h, left the same petrol station and followed the route of the bus. Determine the distance, from the petrol station, covered by the taxi at the same time it caught up with the bus.

(3 mks)

8. The sum of three consecutive odd integers is greater than 219. Determine the first three such integers.

(3 mks)

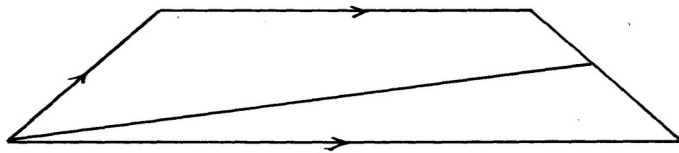
9. A Kenyan company received US dollars 100, 000. the money was converted into Kenyan shillings in a bank which buys and sells foreign currencies as follows;

Buying (in Kenyan shillings)		Selling (in Kenyan shillings)	
1 US dollar	77.24		77.44
1 sterling pound	121.93		122.27

- a) Calculate the amount of money, in shillings, the company received.
(2 mks)

b) The company exchanged the Kenyan shillings calculated in (a) above, into sterling pounds to buy a car from Britain. Calculate the cost of the car to the nearest sterling pound. (2 mks)

10. In the figure below, **OPQR** is a trapezium in which **PQ** is a parallel to **OR** and **M** is the mid- point of **QR**. **OP**= **p**, **OR** = **r** and **PQ** = $\frac{1}{3}$ **OR**



Find **OM** in terms of **p** and **r**. (3 mks)

11. Without using mathematical tables or a calculator, evaluate

$$27^{\frac{2}{3}} \times \left(\frac{81}{16} \right)^{-\frac{1}{4}} \quad (3 \text{ mks})$$

12. Using a ruler and a pair of compasses only, construct a rhombus **QRST** in which angle **TQR** = 60° and **QS** = 10cm.
(3 mks)

13. A fruit vendor bought 1948 oranges on a Thursday and sold 750 of them on the same day. On Friday, he sold 240 more oranges than on Thursday. On Saturday he bought 560 more oranges. Later that day, he sold all the oranges he had at the price of ksh. 8 each. Calculate the amount of money the vendor obtained from the sales of Saturday.
(4 mks)

14. Simplify: $\frac{x^2 + x - 4xy}{(x + 1)} - \frac{4y}{(4y^2 - xy)}$ (3 mks)

15. The diagonal of a rectangular garden measures $11\frac{1}{4}$ m while its width measures $6\frac{3}{4}$ m.

Calculate the perimeter of the garden.

(2

mks)

16. A customer paid ksh. 5, 800 for a suit after she was allowed a discount of 2 % on the selling price. If the discount had not been allowed, the shopkeeper would have made a profit of 20% on the sale of the suit. Calculate the price at which the shopkeeper bought the suit (3 mks)

SECTION II. - (50 MARKS)

Answer any five questions in this section in the spaces provided

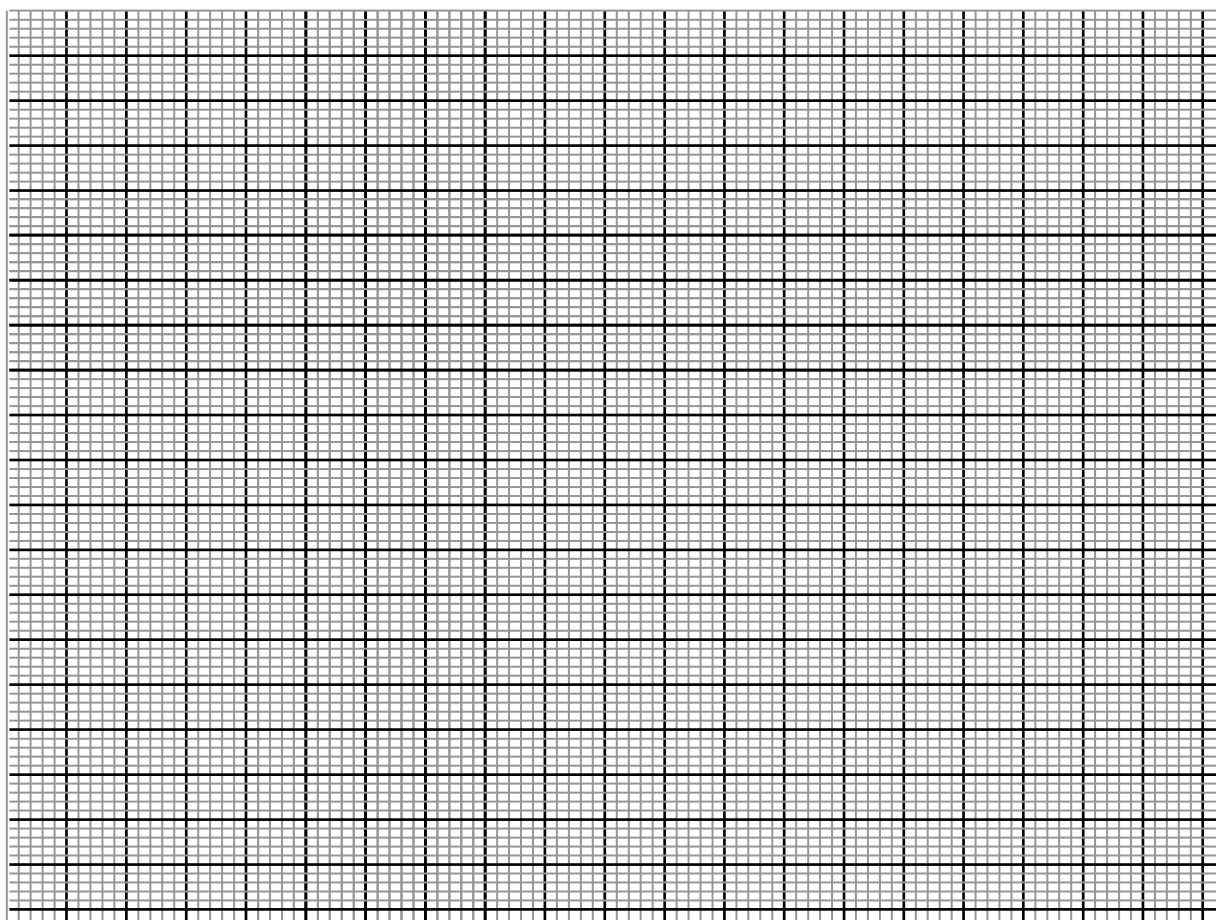
17. The first term of an arithmetic progression (A.P) with six terms is **P** and its common difference is **c**. Another **A.P** with five terms has also its first term as **P** and a common difference of **d**, the last term of two arithmetic progression are equal.
- a) Express **d** in terms of **c** (3 mks)
- b) Given that the 4th term of the second AP exceeds the 4th term of the first one by $1\frac{1}{2}$, find the values and c and d . (3 mks)
- c) Calculate the value of p if the sum of the terms A. P is 10 more than the sum of the terms of the second A. P. (4 mks)

18. In a uniformly accelerated motion the distance, s metres, travelled in time t seconds varies partly as the square of the time. When the distance traveled is 80m and when the time is 3 seconds, the distance traveled is 135 metres.
- a) Express s in terms of t (5 mks)
- b) Find
- i) the distance travelled in 5 seconds (2 mks)
- ii) the time taken to travel the distance of 560 metres. (3 mks)

19. The frequency table below shows the daily wages paid to a casual workers by a certain company.

Wages in shillings	100 - 150	150 - 200	200 - 300	300 - 400	400 - 600
No. of workers	160	120	380	240	100

a) Draw a histogram to represent the above information.
(5 marks)



b) i) state the class in which the median wage lies
(1 mk)

ii) Draw a vertical line, in the histogram, showing where the median lies
(1 mk)

c) Using the histogram, determine the number of workers who earn sh. 450 or less per day. (3 mks)

20. a) Find A^{-1} , the inverse of matrix $A = \begin{pmatrix} 5 & 6 \end{pmatrix}$
(2mks)

b) Okelo bought 5 physics books and six mathematics books for a total of Ksh.. 2440. Ali bought 7 physics books and 9 mathematics books for a total cost of ksh. 3560.

i) Form a matrix equation to represent the above information.

(1 mk)

ii) Use matrix methods to find the price of a physics book and that of a mathematics book.(3 mks)

(c) A school bought 36 physics books and 50 mathematics books. A discount of 5 % was allowed

on each physics book whereas discount of 8% was allowed on each mathematics book.

Calculate the percentage discount on the cost of all the books bought.

(4 mks)

21. A carpenter constructed a closed wooden box with internal measurements 1.5metres long, 0.8 metres wide and 0.4 metres high. The wood used in constructing the box was 1.0 cm thick and had a density of 0.69km^3 .
- a) Determine
- i) Volume in cm^3 , of the wood used in constructing the box .
(4mks)
 - ii) mass of the box, in kilograms, correct to 1 decimal place.
(2 mks)
- b) Identical cylindrical tin of diameter 10cm, height 20cm with a mass of 120g each were packed in the box.
Calculate the:
- i) Maximum number of tins that were packed. (2 mks)
 - ii) total mass of the box with the tins.
(2 mks)

22. The boundaries **PQ**, **QR**, **RS** and **SP** of a ranch are straight lines such that: **Q** is 16 km on a bearing of 040° from **P**; **R** is directly south of **Q** and east of **P** and **S** is 12 km on a bearing of 120° from **R**.
- a) Using a scale km to represent 2 km, show the above information in a scale drawing. (3mks)
- (b) From the scale drawing determine:
- i) the distance in kilometers, of **P** from **S**.
(2 mks)
- ii) the bearing of **P** from **S**.
(2 mks)
- c) Calculate the area of the ranch **PQRS** in square kilometers.
(3 mks)

23. A saleswoman is paid a commission of 2% on goods sold worth over ksh. 100, 000. She also paid a monthly salary of ksh. 12, 000. in a certain month, she sold 360 handbags at ksh. 500 each..

a) Calculate the saleswoman's earnings that month.

(3 mks)

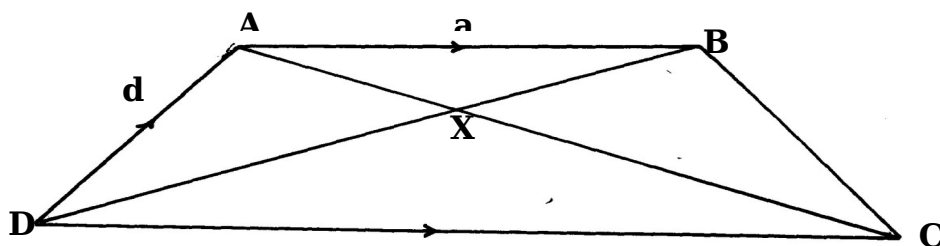
b) The following month the sales woman's monthly salary was increased by 10%. Her total earnings that month were ksh. 17600.

Calculate:

(i) the total amount of money received from the sales of hand bags that month. (5 mks)

ii) The number of handbags sold that month.
(2 mks)

24. In the figure below, **ABCD** is a trapezium, **AB** is parallel to **DC**, diagonals **AC** and **DB** intersect at **X** and **DC = 2AB**. **AB = a**, **DA = d**, **AX = KAC** and **DX = h DB**, where **h** and **K** are constants.



(a) Find in terms of **a** and **d**

i) **BC**

(2 mks)

ii) **AX**

(2 mks)

iii) **DX**

mk)

(1

b) Determine the values of **h** and **k**
mks)

(5