

SECTION I (50 MARKS)
Answer all questions in this section.

1. Use reciprocal tables to find the value of
(3mks)

$$\frac{1}{9} \left\{ \frac{2}{0.6638} + \frac{5}{0.833} \right\} \text{ correct to 4 s.f.}$$

2. Without using mathematical tables or calculators evaluate.

$$\frac{64^{\frac{1}{2}} \times 27000^{\frac{2}{3}}}{2^{-5} \times 27^0 \times 5^2}$$

(3mks)

3. Atyang bought 3 blouses and 2 skirts for a total of Ksh.500. Awino bought 4 blouses

And 5 skirts for a total of Ksh.900. Find the cost of 1 blouse and 3 skirts.
(3mks)

4. Simplify $\frac{\frac{1}{2} \text{ of } 16 - 10 + 2\left(\frac{1}{2} \div \frac{1}{4}\right)}{\frac{1}{3} \times 3\frac{3}{4} \div \frac{1}{4}}$
(3mks)

5. Given that $\sin \theta = \frac{5}{13}$, find $\tan (90^\circ - \theta)$ in its simplest form
(3mks)

6. Okisai is three times as old as his son now. If ten years ago the sum of their ages was 44. How old was Okisai when his son was born ?
(3mks)

7. B(2, 5) is a point on the circumference of a circle whose equation is $2x^2 + 2y^2 - 4x - 8y = 10$.
Find the equation of the tangent to the circle at point B.
(3mks)

8. Solve the inequalities and represent the solution on number line.
(2mks)
 $3x - 9 < 5x + 3 \leq 2x - 6$

9. Twenty women working 12 hours a day take 12 days to complete a job. How many more
Days will it take eight women working 20 hrs a day to complete the same
job ? (3mks)

10. The G.C.D of two numbers is 36 and their L.C.M. is 1260. If one of the numbers is 252,
find the other number.
(2mks)

11. Chakol booksellers received US Dollars 100,000. The money was converted into Kenya

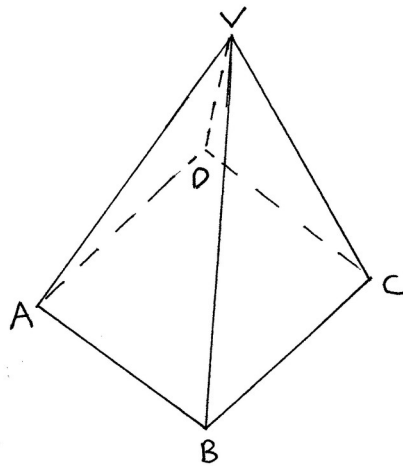
Shillings in a bank which buys and sells foreign currencies as follows :

	Buyng (In Kenya shillings)	Selling (In Kenya shillings)
1 US Dollar	77.24	77.44
1 Sterling pound	121.93	122.27

(a) Calculate the amount of money in Kenya shillings, the business received.
(2mks)

(b) The business exchanged the Kenya 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.
(2mks)

12. The figure below is a right pyramid with slant height of 5cm and square base of 4cm.



(a) Draw its net and label it.
(2mks)

(b) Calculate the total surface area.
(2mks)

13. Find the area of the square of sides $(x + 2)$ Hence find 102^2 .
(3mks)

14. 1600cm^3 of fresh water of density 1g/cm^3 are mixed with 1400cm^3 of sea water of density 1.25g/cm^3 . Determine the density of the mixture.
(3mks)

15. Simplify the expression
(4mks)

$$\frac{2x^2 - 3xy - 2y^2}{9x^2 - y^2} \div \frac{2x + y}{3x + y}$$

16. The position vectors of points A and B are $\underline{a}$ and $\underline{b}$ respectively. Determine the modulus of

$\underline{AB}$ if $\underline{a} = 2\underline{i} + 4\underline{j} + 3\underline{k}$ and $\underline{b} = 2\underline{i} + 3\underline{j}$ (correct to 4 s.f)
(4mks)

SECTION II (50 MARKS)
Answer Any FIVE questions in this section.

17. Akukuranut women group decided to raise sh.126,000 towards a poultry farming project. Each woman was to contribute equal amount. Before the contributions, 7 of them pulled out from the project therefore the remaining members had to pay more.

(a) If P stands for the original number of members, show that the increase in contribution

$$\begin{array}{r} \text{Was} \\ 882000 \\ \hline P(P - 7) \end{array}$$

(3mks)

(b) If the increase in contribution per person was sh.200, find the number of women

That were originally involved in the project.

(4mks)

(c) Calculate percentage increase in the contribution per person caused by the withdrawal of

some women to one decimal place.

(3mks)

18. The following data was obtained for masses of some pregnant women in a maternity clinic

Mass x (kg)	$1.5 \leq x < 5.5$	$5.5 \leq x < 7.5$	$7.5 \leq x < 13.5$	$13.5 \leq x < 15.5$	$15.5 \leq x < 20.5$
No. Of women	16	20	18	14	15

(a) Represent the information in the table above on a histogram, on the graph paper provided. (6mks)

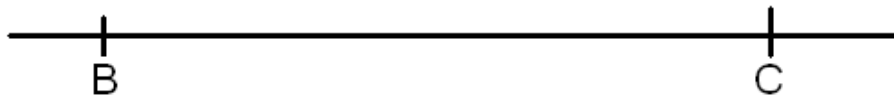


(b) Use the information in the table above to estimate :
 (i) the mean mass.
 (2mks)

(ii) the median mass

(2mks)

19. Use a ruler and a pair of compasses only for all the constructions in this question.
(a) Construct triangle ABC such that BC 6cm, angle ABC = 30 and line BA = 12 cm.
(4mks)

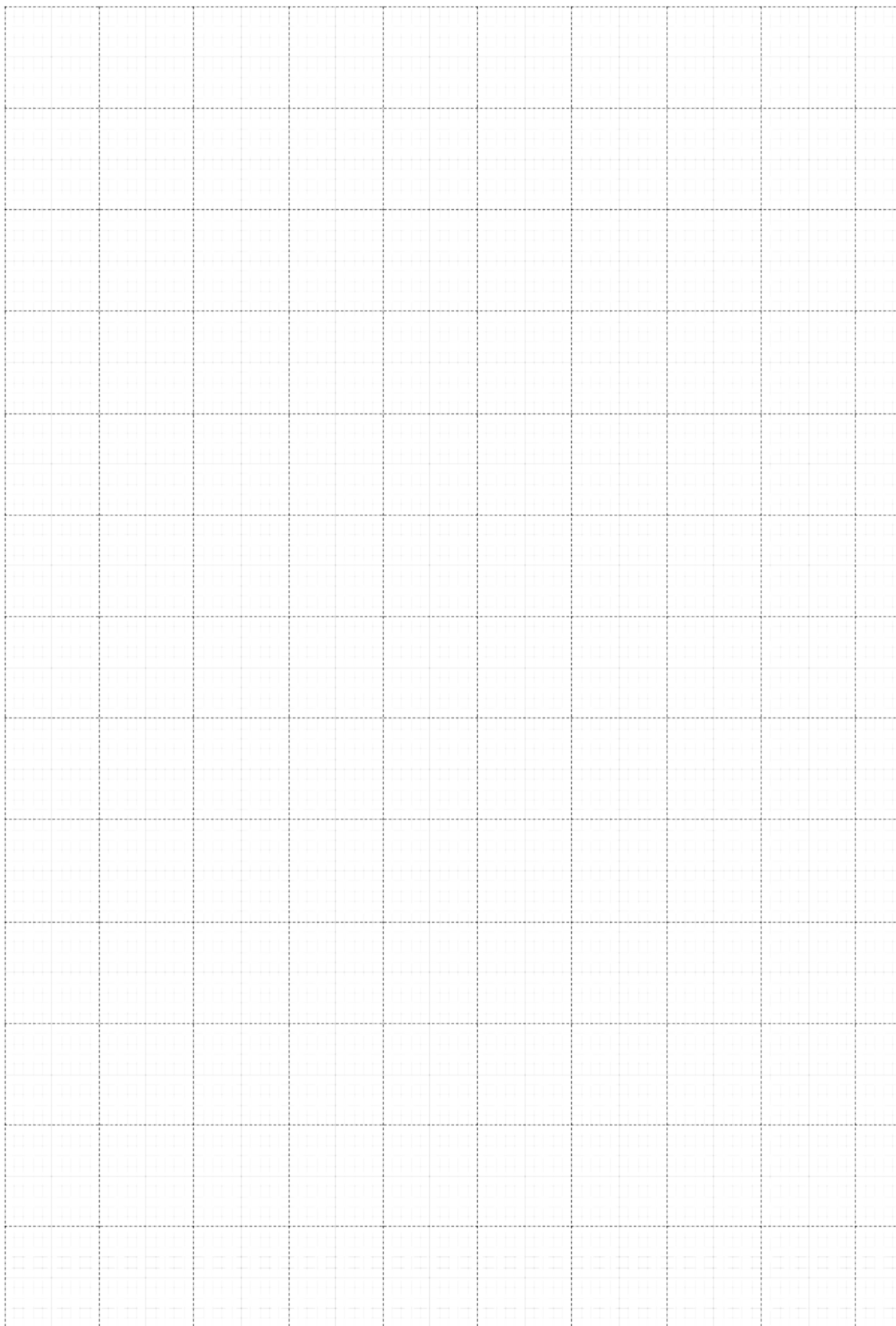


- (b) Construct perpendicular from A to meet BC produced at D. Measure CD.
(2mks)
(c) Construct triangle BPC such that the area of triangle BPC is three quarters of the area of triangle ABC and on the same side of BC as triangle ABC.
(3mks)
(d) Describe the locus of P
(1mk)

20. (a) Complete the table below for the function $y = -2x^2 - 7x + 4$
(2mks)

x	-5	-4	-3	-2	-1	0	1
$-2x^2$	-50	-32		-8		0	
$-7x$	35		21			0	
$+4$	4	4	4	4	4	4	4
$y = -2x^2 - 7x + 4$	-11		7			4	-5

- (b) Draw the graph of $y = -2x^2 - 7x + 4$ for $-5 \leq x \leq 1$
(3mks)



- (c) Use your graph to solve
(i) $-2x^2 - 7x + 4 = 0$

(1mk)

(ii) $-2x^2 - 4x - 2 = 0$ (2mks)

(iii) $-2x^2 - 7x + 2 = 0$ (2mks)

21. During a certain Motor rally competition its predicted that the weather will be either dry (D)

Or wet (W). The probability that the weather will be dry is estimated to be $\frac{3}{10}$. The probability for

A driver to complete (C) the rally during the dry weather is estimated to be $\frac{5}{7}$. The probability for a

driver to complete the rally during wet weather is estimated to be $\frac{1}{8}$. If he completes the rally the probability of receiving a prize (P) is $\frac{4}{5}$ otherwise its $\frac{1}{7}$.

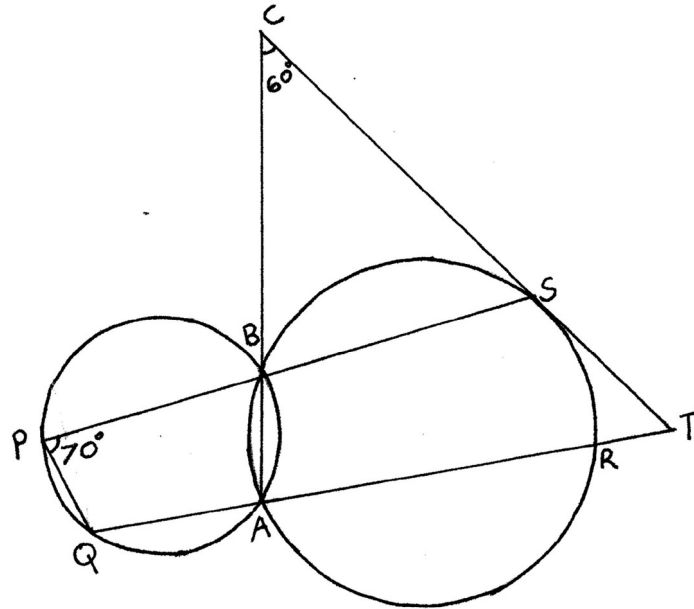
(a) Draw the tree diagram to represent the above information.
(3mks)

(b) Use your tree diagram to find the probability that ;
(i) the driver receives a prize (P).
(4mks)

(ii) the driver did not receive a prize (P)
(3mks)

22. In the figure below two circles ABSR and ABPQ intersect at AB. UST is a tangent to the circle

ABSR at S. Angle BPQ = 70° , PBU = 105° and BUS = 60° . Giving reasons for your answers, find



(a) BAR

(6mks)

(b) BSU

(2mks)

(c) STR

(2mks)

(d) BRS

(2mks)

(e) AQP

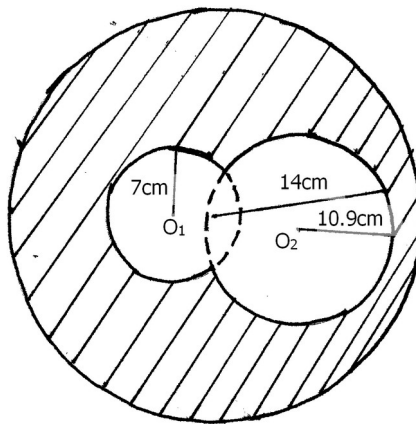
(2mks)

23. Three business partners Omoit, Achola and Amoit contributed Ksh. 100,000, Ksh.80,000 and ksh.50,000 respectively to start a business. After one year the business realized a profit which they shared in the ratio of their contributions.
- (a) If Amoit's share of profit was Kshs.20, 000, how much was the total amount of profit? (3mks)

- (b) At the beginning of the second year, Amoit boosted his shares by Ksh. 10,000. If the business profit increased by 20% at the end of the second year. Calculate;
- (i) Omoit's share of the profit. (4mks)

- (ii) The difference between Omoit's and Achola's share of the profit. (3mks)

24. The diagram below shows a cross section of an oil pipeline centre O and radius 14 cm. The pipe constitutes two other smaller pipes centres O_1 and O_2 with radii 7 cm and 10.5 cm respectively. Oil flows through this smaller pipes. The pipes with centre O_1 and O_2 intersect at P and Q.



- (a) Find the area of the un shaded region if $PQ = 5$ cm (8mks)

(b) Find the area of the shaded region.
(2mks)