

INSTRUCTIONS

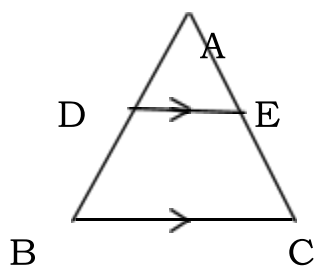
1. This paper consists of fourteen (**14**) compulsory questions.
2. This paper consists of sections **A** and **B**.
3. Mathematical table and non-programmable calculators may be used.
4. Cellular phones are not allowed.
5. The following constants may be used

(a) Radius of the Earth $R = 6370\text{km}$

$$(b) \Pi = \frac{22}{7}$$

SECTION A (60 marks)

1. (a) Arrange the order of the digits in 289414 to make
- (i) The largest possible number (1.5 marks)
 - (ii) The smallest possible number (1.5 marks)
- (b) Use a number line to get a solution; $(+7) - (+4)$ (3 marks)
2. (a) Find the value of X; $\log_3(x + 16) - \log_3 x = 2$ (3 marks)
- (b) Find the value of P, If $\left(\frac{1}{64}\right)^{2+p} = 2^6$ (3 marks)
3. (a) In a group of 240 tourists, 80 speak English, 120 speak French and 60 speak both English and French. How many speak neither English nor French. (Use Venn Diagram) (2 marks)
- (b) A fair die and coin are tossed; show all possible results in a table and a tree diagram. (4 marks)
4. (a) Find the equations of these lines
- (i) Gradient 4 and y-intercept -2 (1.5 marks)
 - (ii) Through (4,7) and (-2,10) (1.5 marks)
- (b) Let $a = 4i + 2j$ and $b = 6i + 2j$. Find $|a - 2b|$ (3 marks)
5. (a) Determine the length of one side of regular polygon of interior angle of 144° when inscribed to the circle of a radius of 10cm. (3 marks)
- (b) In a figure below $DE \parallel BC$



(3 marks)

Given that, $AE = 4\text{dm}$, $AB = 8\text{dm}$, $DE = 10\text{dm}$. Find the value of BC.

6. (a) How many grams are there in 0.00912 tones (t) (3 marks)
- (b) Solo, Theresia, Msuku and Mwanaidi can eat 2 bags of rice in 12 days. Each bag weighs 10kg. How many people can eat 6 bags of the same weight in 18 days. (3 marks)

7. Kichan started business on 1st June 2011 with a capital of 100,000/= and made the following transactions:

June 2: Bought office furniture 40,000/=

7: Bought goods 70,000/=

11: Sold goods 65,000/=

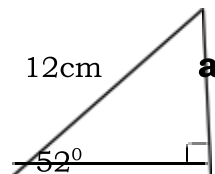
16: Paid Sundry Expenses 30,000/=

19: Cash sales 80,000/=

24: Paid wages 50,000/=

Required: Prepare Cash Account and Purchases Account at the end of the month. (6 marks)

8. (a) Find the sum of the first 10 terms of the series,
 $-1 + 2 - 4 + \dots$ (4 marks)
- (b) If 2, x , 20 are terms of A.P. Find the value of x . (2 marks)
9. (a) Find the value of a



(2 marks)

- (b) In a triangle LMN, $LM=6m$, $LN=5m$ and $\angle MLN = 66^\circ$. Find
- (i) the length MN (Use Cosine Rule) (2 marks)
- (ii) the angle $\angle N$ (Use Sine Rule) (2 marks)
10. (a) Solve the equation $x^2 + 6x + 2 = 0$ by completing the square. (3 marks)
- (b) Expand and simplify $(2x + 5)(2x - 5)$ (3 marks)

SECTION B: (Marks 40%)

11. (a) The examination results of Form Three students at Loyola Secondary School are recorded for a group of students:

Marks (%)	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79
Frequency	5	3	20	2	10

- (i) Draw a histogram (4 marks)
- (ii) State the modal class (1 marks)
- (iii) Estimate the mode from 2(a) (1 marks)

(b) Find the probability of choosing (i) a face card (1.5 marks)

(ii) an ace card (1.5 marks)

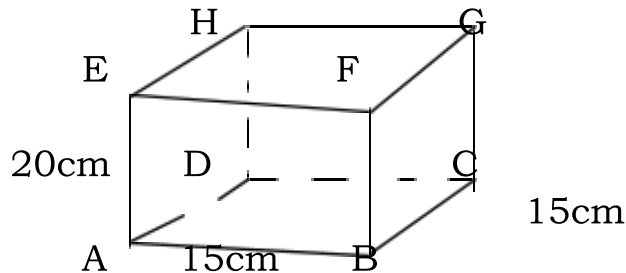
12. (a) The figure below represents a regular cuboids

ABCDEFGH with $AB=15\text{cm}$, $AE=20\text{cm}$ and $AD=15\text{cm}$. Find the

(i) the length AG (3 marks)

(ii) the angle between AG and the plane ABCD (1.5 marks)

(iii) the volume of the cuboids. (1.5 marks)



(b) Calculate the distance from Changwe ($5^{\circ}\text{S}, 39^{\circ}\text{E}$) to

Mangwe ($2^{\circ}\text{S}, 39^{\circ}\text{E}$) in kilometers. Write the answer correct to one decimal place. (4 marks)

13. (a) Find the value of y given that

$\begin{pmatrix} 2 & x & 5 & 10 & x \end{pmatrix}$ is non-singular matrix (3 marks)

(b) Use Cramer's rule to solve for X and Y

$$\{4x + 3y = 6 \dots (i) \quad 2x + 5y = 12 \dots (ii)\}$$

(4 marks)

(c) Find the matrix which rotates by 45° about the origin. (2 marks)

14. A firm makes curtains which are either ordinary or de luxe. Each ordinary curtain takes **3** hours to produce and uses **6m** of material and each de luxe curtain takes **6** hours to produce and uses **7m** of material. The workers of the firm can work for a total of **60** hours and there is **90m** of material available. If the profit on ordinary and de luxe curtains is **4,000/=** TSH and **6,000/=** TSH respectively, find how many of each should be made to maximize profit. (10 marks)