**MBOGO HIGH SCHOOL**

**DEPARTMENT OF MATHEMATICS**

**END OF TERM I EXAMINATIONS APRIL -2013**

SUBJECT ; MATHEMATICS PAPER 1

CLASS ; S.4

DURATION ; 2HOURS 30MINS

**INSTRUCTIONS :**

* Answer all the questions in section A and not more than five questions from section B.
* All necessary calculations must be done on the same page as the rest of the answer.
* Mathematical tables with a list of formulae and squared paper are provided.
* Silent, non- programmable scientific calculators may be used.
* Neat work is a **MUST.**

**SECTION A**

1. Make the subject of the formula

.

2. Solve the inequality and write down the solution set.

3. Given is a singular matrix, find the possible values of .

4. If .Find

5. Solve the equation by method of completing squares.

.

6. A profit of Shs.1260000 is to be shared among three partners A, B and C.C gets 60000 more than B while A gets twice as much as C.Form an equation and solve it to find each person’s share.

7

In the diagram BC=2X cm, AB=(X-1) cm and the area of triangle ABC=30cm2.Find the length of AB.

8. In a home work marked out of 20,a group of pupils obtained the following marks;

15,20,18,17,8,18,16,20,18,17,12 and 19.Find the mode and median marks.

9. Evaluate; .

10. In the triangle, two sides are 2.8cm and 12cm long and the angle between them is 600.Find the length of the third side.

**SECTION B.**

11. (a)

From the point O on the level ground MON,between two buildings, A and B,the angles of elevation of the tops of building A and B,are 380 and 540 respectively. Building B, h metres high, is 2m higher than building A and **MO** = 24m.

Calculate;

i) height of building A.

ii) how far building B is from point O.

(b) At a certain point on the level ground the angle of elevation of the top of a tower,T,is 280.At another point 100 metres away from the first point, the angle of elevation is 350.Find the two expressions for the height of the Tower and give your answer to the nearest metre.

12. (a) A factory makes two kinds of bottle tops “coca cola” tops and “Pepsi” tops. The same equipment can be used to make either. In making “coca cola” tops one man can supervise 10 machines and this batch will give a profit of pound sterling (£) 50 per week.”pepsi” tops yield a profit of pound sterling(£) 250 a week, using 25 machines and 8 men. There are 200 machines and 40 men available. By taking X batches of coca cola tops and Y batches of Pepsi tops, write down four inequalities and an expression for profit P for this information.

(b) Use these inequalities to draw a suitable graph showing the region which satisfies them. From your graph, determine the numbers of coca cola and Pepsi tops which should be made to obtain the maximum profit. Hence find the maximum profit.

13. (a) A fair die and a coin are thrown. Find;

i) the possibility space

ii) the probability of getting a head (H) and a number divisible by 3.

(b) A box contains 5 black balls and 3 red balls. Two balls are randomly picked one after the other without replacement. Find the probability that the balls picked are of different colours.

14. A poultry farm has three units; A, B and C.Unit A produces 30 trays of eggs and 20 broilers every month. Unit B produces 40 trays of eggs and 15 broilers and Unit C, 35 trays of eggs and 10 broilers during the same period. If a tray of eggs costs Shs.3000 and a broiler Shs.4000.

(a) (i) Represent the above information in matrix form of order for the eggs and broilers.

(ii) Form a cost matrix produced on the farm for the eggs and broilers.

(iii) Find the sales of the farm if all eggs and broilers were sold.

(b) If the farm charges a 17 VAT, find the total income from the sales of the farm every month.

15. Town B is100km away from town A on a bearing of 1350.Town D is on a bearing of 900 from town B, 124km a part. Town C 160km away from Town D is on a bearing 0300 from D.Using a scale of 1cm to represent 20km,make an accurate drawing to show the relative positions and distances of towns A,B,C and D.

Determine the;

(a) shortest distance and bearing of town C from A.

(b) distance and bearing of town B from town C.

16. The table below shows ages of 120 students entering senior one.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age in years | 12.5-12.9 | 13.0-13.4 | 13.5-13.9 | 14.0-14.4 | 14.5-14.9 |
| No. of students | 8 | 35 | 52 | 17 | 8 |

(a) State the;

(i) class width

(ii) modal class

(b) Determine the mean and median age of the students.

17. The figure below shows a rectangular piece of paper ABCD which has been folded along EF such that C maps on to G.

Given that EC = 3cm and FC = 4cm, AB = (X+2) cm and AD = (2X+3) cm.

(a) Find;

(i) the area of triangle ECF

(ii) an expression for the area of shaded region ABFGED in terms of X.

(b) If the shaded area is 43cm2, show that 2X2+ 7X- 49 = O.Hence find the length of **AD.**

**END.**

**“SUCCESS TO YOU ALL”**