**GATITU MIXED SECONDARY SCHOOL**

**FORM 4 MATHEMATICS MID TERM EXAM**

**PAPER 1 2015**

**SECTION I (40MKS)**

ANSWER ALL QUESTIONS IN THIS SECTION

SECTION 1 (50 MARKS)

 ANSWER ALL QUESTIONS IN THIS SECTION

1. Use logarithms to evaluate:- (4 marks)

 6.598÷ [(0.9895)2 × 0.004974]3/4

1. Factorize and simplify as far as possible. (4 marks)

 

1. In order to complete a certain job in 10 days a company employs 30 men to work at the rate of 8 hrs a day. Determine how long it would take 20 men working 12 hrs a day to complete the same job. (2 marks)
2. Solve the equation. (2 marks)

 

1. Without using logarithms tables, find the value of; (3 marks)

 Log1096 + 3 Log105 – Log1012.

1. Given that a=2, b=-1 and c =3, find the value of, (3 marks)

 

1. Solve the simultaneous equations. (3 marks)

 3x -2y = 7

 5x + y = 3

1. Find the size of each exterior angle of a regular octagon. (2 marks)
2. A business woman bought 288 bananas at sh. 10 for every 12. She sold all of them at sh. 20 for every 18. What was her percentage profit? (4 marks)
3. Given the following currency exchange rate, calculate to 3 significant figures, the number of dollars that can be exchanged for 25 sterling pounds. (3 marks)

 1 US dollar $ = Ksh. 76. 85

 1 Sterling pound £ = Ksh. 115. 30

1. Three types of coffee A, B, and C are mixed in the ratio 2:3:5 by mass. Type A coffee costs sh. 210 per kg, type B sh. 160 per kg and type C sh. 120 per kg. The blend is sold at a profit of 30%. Determine the selling price of the blend per kilogram. (4 marks)
2. A cold water tap can fill a bath in 6 minutes while a hot water tap can fill it in 12 minutes. The drainage pipe can empty the bath in 8 minutes. All three are opened fully for 3 minutes and then the hot water tap is closed. How many more minutes will it take to fill the bath?(4 marks)
3. Find the range of values of x which satisfy the following inequalities simultaneously.(3 marks)

4x – 6 ≥ x -12

8 – 3x > 2x – 7

1. Represent this range of values of x on a number line. (1 mark)
2. The sum of the first 8 terms of an AP is 236 and the sum of the first 6 terms of the same series is 147. Find the sum of the first 12 terms of the series. (4 marks)
3. A cylindrical tank whose diameter is 1.4 meters and height 80 cm is initially empty. Water whose volume is 492.8 litres is poured into the tank. Determine the fraction of the tank filled with water. (4 marks)

 SECTION II (50 MARKS)

 ANSWER ANY FIVE QUESTIONS IN THIS SECTION.

1. The model of an aircraft is designed such that the volume of its interior airspace is 125 cm3. The volume of the airspace of the actual aircraft is 3375 litres.
2. Given that the wing span of the actual aircraft is 7.44m, find the wingspan of the model in centimeters. (4 marks)
3. If the total surface area of the model is 2420 cm2, find the total surface area of the actual aircraft in m2 (3 marks)
4. Calculate the cost of the materials used to build the actual aircraft if the material costs us dollars 2.5 per cm2. (3 marks)

1. A Jua kali artisan made an article and sold it to a wholesaler at a profit of 20%. The wholesaler sold the article to a retailer at a profit of 30%. The retailer finally sold the article to a customer at a profit of 50%.
2. If it cost the artisan sh. 500 to make the article, find how much the customer paid for it. (3 marks)
3. A customer paid sh. 1560 for another article. Determine how much the wholesaler had paid for it. (3 marks)
4. During a clearance sale the retailer reduced his prices by 10%. Find the percentage profit the retailer made on an article which had cost the artisan sh. 1000 to make. (4 marks)
5. The figure on the right shows a circle centre O and radius 21 cm. The minor are ABC subtends and angle of 1200 at the centre of the circle.

Take π=22/7

 

1. Find the area of the mirror sector OABC (2 marks)
2. The sector is cut off and folded to form a hollow cone. Find the base radius of the cone.(4 marks)
3. Calculate to one decimal place the vertical height of the cone. (2 marks)
4. Calculate to the nearest whole number the capacity of the cone. (2 marks)
5. The angle of elevation of the top of a vertical tower from a point P is 300. The angle of elevation of the top of the tower from another point Q which is nearer the foot R of the tower is 450. The distance between P and Q is 20 meters and the points P, Q and R are on the same straight line on level ground.
6. Using a scale of 1cm to represent 5m, draw an accurate scale drawing to represent the above information. (4 marks)
7. Use your scale drawing to determine;
8. The height of the tower. (2 marks)
9. The distance QR (2 marks)
10. The distance PR (2 marks)
11. The diagram shows a right glass prism ABCDEF with the dimensions as shown. Calculate to one decimal place,

 

1. The total surface area of the prism. (4 marks)
2. The volume of the prism. (3 marks)
3. The angle between the planes BCEF and ABCD (3 marks)
4. The diagram on the right represents a right cone of the base radius 28cm from which a small cone is cut off to form a frustum. The top of the radius of the frustum is 21cm and its height is 10cm as shown. Calculate to the nearest whole number the total surface area of the frustum. (10 marks)

 