**GESIAGA SECONDARY SCHOOL**

**FORM FOUR 2016**

**MATHEMATICS SERIES 2**

**SECTION I**

***Answer all questions***

1. Evaluate (3mks)

$$\frac{\frac{1 }{3 }of \frac{6}{11}}{\frac{2}{5}} + \frac{\frac{3}{4}+\frac{2}{7}}{\frac{1}{4}}$$

1. Use mathematical table to evaluate (2mks)

$$\sqrt[3]{3456}$$

1. The sum of interior angles of a regular polygon is 24 times the exterior angle. Find
2. The number of sides of the polygon and state its name (3mks)
3. The sum of interior angles (2mks)
4. Solve for x (3mks)

32x+1 + 32x = 108

1. Use reciprocals table to evaluate (3mks)

$$\frac{12}{13.42}+\frac{5}{0.046}$$

1. Use logarithm tables to evaluate (3mks)

$$\sqrt{\frac{247 x 492}{412 x 605}}$$

1. A two digit number is such that the product of its digits is 12. When the digits are reversed, the number formed exceeds the original number by 9. Find the original number. (3mks)
2. Determine the equation of the line that passes through point A(2,4) and parallel to the line whose equation is y=2x -3. (3mks)
3. The ratio of the total surface area of two similar cones is 25:16. Find the ratio of their volumes. (2mks)
4. Below shows a square which was rotated through the centre O. draw and show the image of the square. (3mks)

A B

 O

C D

1. Solve for x given that (2mks)

Sin 3x = cos (x+10)

1. The angle of depression from the top of the flag post to point A and B on the ground are 380 and 240 respectively. If the distance between the two points A and B is 80m. Find the height of the flag post. (4mks)
2. The position vectors of P and Q are, **p**=3**i** + 2**j** + 5**k** and **q**=5**i** + 6**k** respectively. Find the magnitude of vector **pq**. (3mks)
3. Find the angle indicated by x (2mks)

1. The table below shows the marks scored by 40 form four students in a mathematics test at gesiaga secondary school.

|  |  |
| --- | --- |
| marks | Frequency |
| 30-34 | 2 |
| 35-44 | 6 |
| 45-49 | 5 |
| 50-64 | 15 |
| 65-70 | 12 |

Find,

1. The mean mark for the students (3mks)
2. Draw a histogram for the information above (3mks)
3. Factorize (2mks)

3x2 – 5x -2

Hence use your solution above to solve the equation (1mk)

3x2 – 5x – 2 = 0

**SECTION II**

***Answer all questions***

1. A bus left Mombasa and travelled towards Nairobi at an average speed of 60km/hr. after $2\frac{1 }{2}$ hours, a car left Mombasa and travelled along the same road at an average speed of 100km/hr. if the distance between Mombasa and Nairobi is 500km,
2. Determine;
3. The distance of the bus from Nairobi when the car took off. (2mks)
4. The distance the car travelled to catch up with the bus. (4mks)
5. Immediately the car took caught up with the bus, the car stopped for 25 minutes. Find the new average speed at which the car travelled in order to reach Nairobi at the same time as the bus. (4mks)
6. Two circles of radii 3.5cm and 4.2cm with centers O1 and O2 respectively intersect at points A and B as shown in the figure below. The distance between the centres is 6 cm.

 O1 o

 02

Calculate;

1. angle AOIB to the nearest degrees (3mks)

1. angle AO2B to the nearest degree (3mks)
2. area of the quadrilateral OIAO2B, correct to 2dp (2mks)
3. the shaded area correct to 2 sf (take $π=22/7)$ (2mks)
4. P and Q are points whose coordinates are (-2,4) and (a,3) respectively. B is another point with coordinates (2,0) such that PQ has a gradient -1/3. Find a. (2mks)
5. Write PQ as a column vector (2mks)
6. PQBA is a parallelogram. Determine the coordinates of A. (2mks)
7. Parallelogram PQBA is reflected in the line y=6, write down the coordinates of the image PIQIBIAI  (4mks)
8. Consider the vessel below,

 21 21cm

30cm

1. Calculate the volume of water in the vessel. (2mks)
2. When a metallic hemisphere is completely submerged in the water, the level of water rose by 6cm. calculate;
3. The radius of the new water surface. (3mks)
4. The volume of the metallic hemisphere to 4sf. (3mks)
5. The diameter of the hemisphere. (2mks)
6. ABC is a triangle with vertices A(3,4), B(1,3) and C(2,1)
7. Draw the triangles ABC and A’B’C’, the image of triangle ABC under a rotation of +900 about (0,0). (2mks)
8. Draw triangle A’’B’’C’’ the image of triangle A’B’C’ under a reflection in the line y=x. (2mks)
9. Draw triangle A’’’B’’’C’’’, the image of triangle A’’B’’C’’ under a rotation of -900 about (0,0) (2mks)
10. Describe a single transformation that maps triangle ABC unto triangle A’’B’’C’’ (2mks)
11. Write down the equation of the line of symmetry of the quadrilateral BB’’A’’’A’ (2mks)