

**GATTU SECONDARY SCHOOL, P.O. BOX 327 – 01030, GATUNDU.**

**FORM 3 MATHEMATICS MID TERM EXAMINATION. TERM 2 2015.**

Q1. Find the percentage error in calculation of perimeter of a regular hexagon whose side measures 12.6cm. (4mks)

2. Find the quadratic equation whose roots are -2, and -3. (3mks)

3. Find the relative error when  $\frac{2}{3}$  is rounded off to 2 decimal places. (3mks)

4. A bicycle whose marked price is sh 6,000 is sold on hire purchase by 15 equal instalments of sh.600.

Calculate the carrying charge. (3mks)

5. if  $\theta$  lies between  $0^\circ$  and  $180^\circ$  and  $\sin \theta = 0.5$ , Find two possible value of  $\theta$  (2mks)

6. Solve the following equation

$$\log_{10}(6x-2) - 1 = \log_{10}(x-3) \quad (3\text{mks})$$

7. Solve for x in the equation

$$\frac{81^{2x} \times 27^x}{9^x} = 729$$

(3mks)

8. A water pump costs sh 21,600 when new. At the end of the first year its value depreciates by 25%. The depreciation at the end of second year is 20% and thereafter the rate of depreciation is 15% every year. Calculate the exact value of water pump at the end of the fourth year.

(4mks)

9. A passenger noticed that she had forgotten her bag in a bus 12 minutes later after the bus had left. To catch up with the bus, she immediately took a taxi which travelled at 95Km/h. The bus maintained an average speed of 75km/h.

Determine

a) the distance covered by the bus in 12 minutes (2mks)

b) The distance covered by the taxi to catch up with the bus. (3mks)

10. Write the expression  $\frac{4 + 3\sqrt{2}}{3 - 2\sqrt{2}}$  in form of  $P + q\sqrt{2}$  where p and q are rational numbers (4mks)

11. Express 0.351 as a fraction (3mks)

12. Without using tables or calculator, evaluate

$$\frac{20 \times (-3) (-0.1) + (-2)^3}{8 \div 0.4} \quad (3\text{mks})$$

13. Factorize  $x^2 - y^2$

Hence evaluate without using calculator  $10,002^2 - 10,0001^2$  (3mks)

14. In a sale goods, worth originally sh 8,000 were reduced to sh 6,200. Find the percentage reduction. (3mks)

15. A cylinder of radius 4cm contains water. A cube of side 2cm is dropped into the cylinder so that it is covered by water. Find the rise in the level of the water. (4mks)

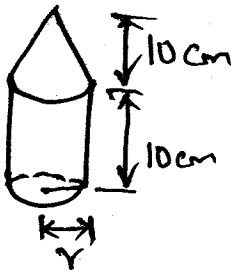
16.

SECTION II

Using a ruler and compasses only construct the quadrilateral ABCD with  $BA = 3\text{cm}$ ,  $AD = 4\text{cm}$ ,  $BC = 7\text{cm}$ ,  $CD = 6\text{cm}$  and  $\angle BAD = 135^\circ$  (4mks)

b) The diagram below shows a cone on top of a cylinder Find.

a) the ratio of volume of the cone to the volume of the cylinder. (3mks)



b) If the total volume is  $480\pi \text{ cm}^3$  Find the value of r.

17. Draw the graph of  $y = 2x^2 + x - 1$  for  $-4 \leq x \leq 4$

(4mks)

A i) Using your graph, solve

$$2x^2 + x - 1 = 0$$

(2mks)

ii)  $2x^2 + x = 0$

(2mks)

iii)  $2x^2 - 5 = 0$

(2mks)

18. Draw a graph of  $y = \sin x$  for  $0^\circ \leq x \leq 360^\circ$  (4mks)

$$y = \sin x \text{ for } 0^\circ \leq x \leq 360^\circ$$

a) Use the graph to solve

i)  $\sin x = 0.6$  (2mks)

ii)  $\sin 2x = 0.876$  (2mks)

iii)  $\sin x = -0.5$  (2mks)

19. The table shows Kenya Tax rates in a certain year.

Income (K£ per annum)	Tax rates (sh per K£)
1 – 4512	2
4,513 – 9024	3
9,025 -13536	4
13,537-18,048	5
18,049 -22,560	6
OVER 22,560	6.5

In that year Muhando earned a Salary of Ksh 16,510 p.m. He was entitled to a monthly tax relief of Kshs 960.

Calculate

a) Muhando's annual salary in K£ (3mks)

b) the monthly tax paid by Muhando in Ksh. (7mks)

20. Mr. Kariuki invested sh 100,000 at compound interest. After two years it had increased to sh 116,640

a) What was the rate of the interest? (3mks)

b) At this rate of interest, how long will it take for the sum to reach sh 150,000. (3mks)

c) The present cost of a land is 4,072,000. Its cost 10 years ago was sh 2,500,000 if this land has been appreciating in value uniformly. Determine the annual rate of appreciation. (4mks)