

MID-TERM TWO EXAMINATIONS 2019.

S.3 MATHEMATICS.

DURATION: 2HOURS 30MINUTES.

INSTRUCTIONS TO CANDIDATES:

This paper consists of two sections namely:

Section A and Section B.

Section A ten (10) compulsory questions; each carries 4marks.

Section B has seven (7) essay questions, each carrying 12 marks .Attempt five (5) questions from this section.

Poor handwriting and unnecessary mistakes may lead to loss of marks.

No time will be added beyond the allocated time for the paper. Type equation here.

SECTION A

1. Without using tables or calculator , simplify $2^{1/2} \div (4^{1/3} \cdot 2^{1/4}) / 4^{1/6}$
2. By expressing each of the numbers in the form $a \times 10^n$, where n is an integer , Evaluate $\frac{0.24}{0.0006}$.
3. Given that $OA = a = \begin{pmatrix} 12 \\ 16 \end{pmatrix}$ and $OB = b = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$, Calculate the length of AB.
4. Without using tables or calculator, Evaluate $\log_{10} 40 + \log_{10} 50 - \log_{10} 20$
6. The points $P(8,11)$ and $Q(12,19)$ lie on a line parallel to another line through $O(0,0)$. Find the equation of a line through $O(0,0)$.
7. Given that $a * b = ab^2 + b - a$, Evaluate 0.01×150 correct to 3sfs.

8. Petrol costs shs 0.85 per litre in USA. Find the price of petrol in pound sterling (£), if 1us =£0.48

9. simplify $(3^x \times 9^x + 1)/27^{x-1}$

10. A number is selected at random from the set $B = \{3, 6, 9, 12, 15, 18, 21\}$. Find the probability that the number is even. Type equation here.

SECTION B

11. Given that $OP = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $PQ = \begin{pmatrix} 4 \\ -8 \end{pmatrix}$, $OR = \frac{1}{2}OQ$ and s is a point on PQ such that $PS:SQ=1:3$, find:

(a) OR

(b) (i) PR

(ii) Length of PR

(c) OS

12. (a) Given that $T = \{2, 5, 6, 8, 9, 10, 12, 13\}$, Illustrate on papygrams the relations :

(i) "greater than by 3"

(ii) "Factor of".

(b) If $f(x) = x+3$ and $g(x) = \log_{10} x + 2$. Find

(i) the value of x when $f(x)=0$

(ii) $gf(85)$

13. (a) Solve the equation $3(1+x/y) - (x/1-2y) = 5/6$.

(b) given that $M = \begin{bmatrix} 0 & 1 \\ 3 & 0 \end{bmatrix}$ and $N = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$;

(i) calculate N^2 and MN

(ii) $N^2 + KN = MN$

14. A quantity P varies partly constant and partly as the square of q .
when $q=2, p=0$ when $q=3, p=65$

(a) Form an equation relating P and q .

(b) Determine the value of q when $p=100$.

15. (a) (i) make y the subject of $\frac{1}{y} + B = \frac{x}{2n}$

(ii) Find the value of y when $n=10$, $x=65$ and $B=3$.

(b) Betty is 9 years younger than Eric. John is three times as old as Betty. The sum of all their ages is 49 years. Find :

(i) John's

(ii) Eric's age.

16.(a) Factorise $a^2 - b^2$ completely. Hence evaluate $3.14^2 - 0.14^2$

(b)(i) Express $x^2 + 5x + 6$ in the form $(x+p)^2 + q$ where p and q are constants. Hence solve the equation $x^2 + 5x + 6 = 0$

(ii) Use the formula to solve the equation $x^2 + 5x + 6 = 0$

17.(a) Find the highest common factor (HCF) of 9, 12 and 15.

(b) A senior three class had 120 girls, 76 opted to take commerce (C), 25 took political education (P) only, 60 girls took both P and C. How many girls took neither P nor C?

(c) Find the equation of a line passing through the points $(-7, -2)$ and $(-3, 4)$.

END

GOOD LUCK