SECTION A (40MARKS)

Answer all the questions in this section

1-Make G the subject of the equation $T=2\pi\sqrt{H}/G$ (4marks)

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2-Given that A is the set of all even numbers less than 20 and B is the set of all triangular numbers less than 20 find: (4marks)

   (i)   AnB

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   (ii)   AUB

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3-Solve the simultaneous equation:(4marks)

3x+4y=5

2x+3y=3

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4-Write a condition for divisibility by 4 :   (4marks)

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5-Which of the following are divisible by the first numbers   (4marks)

   (a) 3 :   924   471 692

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   (b) 5 : 854   1455   6720

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6- Define probability: (4marks)

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7-In an experiment of tossing two dice and recording the number of points on the two appearing faces, write the following events: (4marks)

A:getting a sum less than 5

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B:getting a sum less than 2

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C:getting the same number on the two faces

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8-Given the matrix A(4marks)

$$\begin{bmatrix} 3 & 5 & 9 \\ 2 & 6 & 8 \\ 4 & 7 & 1 \end{bmatrix}$$

Find,

    (i)   The dimension of the matrix

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    (ii)   The element a_{32}

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    (iii)   the transpose of matrix A

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9-Solve for Q in the equation

½(1-q)$<$ 1/3(2-q)   (4marks)

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10-Solve the equation $x^2 - 6x + 9$ using a formula: (4marks)

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SECTION B (60 MARKS)

Attempt any five (5) questions (All questions carry equal marks)

11-(a)(i) Find the simple interest on SSP 20,000 for 2 years at 3/2 % per annum: (3marks)

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(ii)Find the amount after 2 years   (3marks)

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(b)Solve the following equations for x

(i) $3^{2x-1} = 2187$ (3marks)

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(ii) Log $(7x + 2) -$ Log $(x - 1) = 10$ (3marks)

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12-(a) If f(x)=4x -3 , g(x)=x$^2 - 5x$, find:
    (i)   F(3)   (3marks)

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        _____

(ii)   (f.g)(3)   (3marks)

(b)(i) Find the derivative of the function y=3x+5 from the first principle: (3marks)

(ii) Integrate the function 3x+1   3marks)

13-(a)(i) Find the equation of the circle whose center is (2,-3) and its radius is 4 units
 (3marks)

(ii)Find the center and the radius of the equation $x^2+y^2-2x-6y-26=0$ (3marks)

(b)If $Z_1=1+2i$, $Z_2=-5+3i$, $Z_3=-2+I$ Calculate the following

(i) $Z_1 + Z_2$ (3marks)

(ii) $Z_1 \times Z_3$ (3marks)

14-(a) Given Sin $\theta=3/5$,Cos $\theta=4/5$, find:

(i)   Tan θ (3marks)

(ii)   Tan θ + Sin θ (3marks)

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(b)(i) Find the sum of the first seven terms of the G.P 4+(−8) +16 + --------   (3marks)

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(ii) The sum of an A.P of 8 terms is 90 and the first term is 6 .What is the last term?
(3marks)

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15-(a)(i) How many six letter words can be formed from the letters x,y,z,l,m,n,e without reputation of a letter in a word, if it is not necessary for a word to be meaningful?
   (3marks)

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(ii) Write the combination $^{10}C_3$ in the simplest form: (3marks)
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(b)If a = $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$, b= $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$,find
(i) a + b   (3marks)
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(ii) The modulus of a + b   (3marks)
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16-(a) the table below shows masses of some tomatoes bought from a famer:

Mass(in g)	58	59	60	61	62	63
frequency	2	6	12	9	8	3

Find,

(i)   The mean   (3marks)

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(ii)   The median   (3marks)

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(b)Estimate the area between the curve and the two axis in the figure below:
(Given the width =2 units)   (6marks)

17-(a)(i) M(4,3) is the midpoint of the line segment XY. Given the coordinate of X are (6,5).Find the coordinate of Y: (3marks)

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(ii) Represent the set X={3,5,7,4} , Y={2,6} in a Venn diagram: (3marks)

(b)(i) Solve the inequality : $3(1/2x - 4) \leq 4(x - 2)$ (3marks)

(ii) Graph the solution on a number line: (3marks)