GARISSA UNIVERSITY

UNIVERSITY EXAMINATION 2017/2018 ACADEMIC YEAR <u>ONE</u> <u>THIRD</u> SEMESTER EXAMINATION

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCE`

FOR THE DIPLOMA IN INFORMATION TECHNOLOGY

COURSE CODE: DIT 027

COURSE TITLE: MATHEMATICS FOR TECHNOLOGY

EXAMINATION DURATION: 2 HOURS

DATE: 07/08/18   TIME: 9.00-11.00 AM

INSTRUCTION TO CANDIDATES

- **The examination has FIVE (5) questions**

- **Question ONE (1) is COMPULSORY**

- **Choose any other THREE (3) questions from the remaining FOUR (4) questions**

- **Use sketch diagrams to illustrate your answer whenever necessary**

- **Do not carry mobile phones or any other written materials in examination room**

- **Do not write on this paper**

This paper consists of TWO (2) printed pages   *please turn over*

QUESTION ONE (COMPULSORY)

A. Express 13x12x11 in factorial notation **[3 Marks]**

B. Solve for x : $16^{2c} = 0.25$ **[3 Marks]**

C. In how many ways can a team of 7 players be choosen from 15 players? **[3 Marks]**

D. Solve the equations: $5x^2+3x = 2$ **[4 Marks]**

E. Simplify:

$$\frac{7!}{12!\,5!} + \frac{12!}{13!\,4!}$$ **[4 Marks]**

F. Evaluate : a) $^{11}P_8$ b) $^{10}C_6$ **[4 Marks]**

G. Given the equation $2^{2x+1} \times 3^x = 8^x \times 3^{2x-1}$, Show that $6^x = 2/3$ **[5 Marks]**

H. Solve $\log_3(3x+9) - \log_3(2x) = 1$ **[4 Marks]**

QUESTION TWO

I. The following are the marks obtained by 40 pupils in a Mathematics test:

14	10	7	6	9	7	15	10	13	11
8	11	6	10	12	8	7	11	12	7
7	10	12	10	11	10	9	10	9	13
9	13	10	9	7	11	11	8	12	8

Construct a frequency table for the data. **[3 Marks]**

II. The sum of two digits is 10 and the sum of their squares is 58. Find the digits.

[3 Marks]

III. Solve *for x in the equation* $3^{x^2} - 9^{6x-2x} = 0$ **[4 Marks]**

IV. Write n,(n-1),(n-2) using Factorial notation. **[3 Marks]**

V. a) A sequence is defined by S(n)=(-1) (n² – 3n) where n is a natural number. Find the first three terms and the tenth term of the sequence. **[4 Marks]**

b) Find the domain of the function f(x)=4/x for the range -4 f(x) -1/4 **[3 Marks]**

QUESTION THREE

I. Solve $2x^2 + 3x + 1 = 0$ using the quadratic formula. **[4 Marks]**

II. Evaluate $\log_4 7$ **[3 Marks]**

III. In an examination the marks scored by 50 candidates were recorded as shown below:

Marks	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Frequency	2	4	7	6	10	8	5	5	2	1

Calculate:

i) The mean of the data using the assumed mean method. **[4 Marks]**

ii) Median **[3 Marks]**

iii) The Modal class **[1 Marks]**

III. Write the following equation as a single logarithm with a coefficient of 1.

$7\log_{12} x + 2\log_{12} y$ **[5 Marks]**

QUESTION FOUR

I. Define a) Combination

b) Permutation **[2 Marks]**

II. From the foot of a tower 30 Metres high, the top of a flagpole has an angle of elevation of 30⊙. From the top of the tower, it has an angle of depression of 45⊙. Find the height of the flagpole and its distance from the tower. **[5 Marks]**

III. A function f is defined by $f: x \rightarrow x^3$, where x is an integer in the interval $0 \le x \le 4$. List the corresponding set of elements in the range of function. **[5 Marks]**

IV. *Solve for x in the equation*

$$Log_2 (x + 5) + Log_2 (x + 2) = Log_2 (x + 6) .$$

[4 Marks]

V. Write n,(n-1),(n-2) using Factorial notation. **[4 Marks]**

QUESTION FIVE (20 Marks)

a) Define:

  i) Probability

  ii) Statistics **[2 Mark]**

b) The data below gives the marks scored by 30 students in a test

42	10	80	64	20	84	16
46	34	56	43	28	49	51
74	78	60	55	49	64	46
66	47	37	55	69	15	41
	81	50				

i) Find the range in the data [**1 mark**]

ii) Prepare a frequency table with classes $1 - 10, 11 - 20$…. **[3 Marks]**

iii) State the modal class **[1 Mark]**

iv) Estimate : a)The median **[4 Marks]**

        b) mean **[4 Marks]**

Given $3^{4m+1} x\ 27^{m+1} = \frac{1}{81}$ find the value of P **[5 Marks]**