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**TECHNICAL UNIVERSITY OF MOMBASA**  
**FACULTY OF APPLIED AND HEALTH SCIENCES**  
**DEPARTMENT OF MATHEMATICS & PHYSICS**  
**UNIVERSITY EXAMINATION FOR:**  
**CERTIFICATE IN COMPUTING AND INFORMATION**  
**TECHNOLOGY**

AMA 1152: MATHEMATICS

SPECIAL/ SUPPLEMENTARY EXAMINATIONS

**SERIES:** SEPTEMBER 2018

**TIME TWO HOURS**

**DATE:** Sep2018

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of Choose No questions. Attempt Choose instruction.

**Do not write on the question paper.**

Q1. (a) Define and give an example

(i) Mutually exclusive events (3mks)

(ii) Independent events (3mks)

(b) A coin is tossed three times

(i) Draw a tree diagram to illustrate all the possible outcomes.(3)

Find the probability of obtaining\

(ii) One head (2mks)

(iii) Two heads and a tail in that order (2mks)

(iv) Two heads and a tail in any order (3mks)

© (i)  $\frac{1}{1+\sqrt{3}}$  (2mks)

(ii)  $\frac{1}{1-3\sqrt{2}}$  (2mks)

(d) Solve  $3^x = 5$  (3mks)

Q2. (a) Convert to binary given

(i)  $85_{\text{ten}}$  (4mks)

(ii)  $3AF-7C_{16}$  to base ten (4mks)

(b) (i) Add 10111

+ 1011 (3mks)

(ii) Multiply 1101

$\times 111$  (3mks)

© Given  $t = 2\bar{\Lambda} \sqrt{\frac{e}{g}}$  find  $e$  in terms of  $t, \bar{\Lambda}$  and  $g$ . (2mks)

(d) Find  $\begin{vmatrix} 3 & 2 & 1 \\ 1 & 0 & 5 \\ 3 & 4 & 1 \end{vmatrix}$  (4mks)

Q3. (a) Solve the equation  $3^{x+1} = 2^{2x-3}$  (5mks)

(b) Solve to four significant figures  $2^x = 5$  (5mks)

© Show that (i)  $\text{Cos}^2\theta + \text{Sin}^2\theta = 1$  (5mks)

(ii)  $1 + \tan^2\theta = \sec^2\theta$  (5mks)

Q4. (a) Solve by completing the square

$$8x^2 + 2x - 1 = 0 \quad (2\text{mks})$$

(b) Given the series  $1+4+7+10+\dots+43$

Find (i)  $a_{10}$  (3mks)

(ii)  $s_{10}$  (3mks)

(iii)  $n$  for 43 (3mks)

© Given  $1, \frac{1}{2}, \frac{1}{4}, \dots$

Find (i)  $a_8$  (3mks)

(ii)  $s_{10}$  (3mks)

(iii)  $s_{\infty}$  (3mks)

Q5. (a)

Class	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59
Frequency	1	3	8	12	9	2

Find (i) Modal class (3mks)

(ii) Mean (5mks)

(b) Find the mean and quartile values for

$55, 61, 57, 60, 57, 60, 58, 61, 59$  (12mks)

