TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Applied & Health Sciences

DEPARTMENT OF MATHEMATICS & PHYSISCS

CERTIFICATE IN MEDICAL LABORATORY SCIENCE (DMLS)

AMA 1105: FOUNDATION MATHEMATICS

END OF SEMESTER EXAMINATION
SERIES: DECEMEBER 2014
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*
This paper consist of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Find the (i) Mean
          (ii) Mode
          (iii) Median
          (iv) Range   **(3 marks each)**

b) Factorize $3x^2 + 5x + 2$ and hence solve $3x2 + 5x + 2 = 0$ **(3 marks)**

c) Expand $(2x - y)^3$ **(3 marks)**

d) Find the inverse of $A = \begin{pmatrix} 7 & 3 \\ 4 & 5 \end{pmatrix}$ **(3 marks)**

e) Rationalize $\dfrac{1}{1 + 2\sqrt{5}}$ **(3 marks)**

f) Find the equation of the linear passing through A(5, 7) and B(6, -3). Find the coordinates of the midpoint of the line $\overline{AB}$ **(6 marks)**

Question Two

a) (i) Simplify $\dfrac{\log 625}{\log 5}$ **(2 marks)**

(ii) Solve by elimination method
$$2x + y = 5$$
$$7x + 3y = 4$$
    (3 marks)

b) Solve $\dfrac{1 - 58}{4} - \dfrac{5(1 - 38)}{5} = 7$ **(2 marks)**

c) Simplify (i) $8^{4/3}$

(ii) $27^{2/3}$ **(2 marks)**

d) Expand $(1 + \sqrt{2})(2 + 2\sqrt{2})$ **(2 marks)**

e) Solve (i) $a^2 - 5a - 14 = 0$ **(3 marks)**

$$25x^2 - 81 = 0$$

(ii)   by factorization only   **(3 marks)**

Question Three

$$T = 2\pi \frac{l}{q}$$

a) (i) Make of the subject of the formula   **(3 marks)**

$$x^2 y + 3y^2 - 4xy \qquad \wedge = -3$$

(ii) Find the value of   given   and y = 5   **(3 marks)**

b) Share out 64 items in the ratio 1:3:4   **(6 marks)**

c) Y varies inversely as P If y = 200 when P = 4, find y when P = 10   **(4 marks)**

$$\int_3^5 x^6 \, dx$$

d) Evaluate   **(4 marks)**

Question Four

$$\frac{dy}{dx} \qquad y = x^2$$

a) From definition find   given   **(4 marks)**

$$3x + 3y = 4$$
$$2y + 2y = 5$$

b) Solve by substitution given   **(3 marks)**

$$3x^2 + x - 1 = 0$$

c) Solve by quadratic formula given   **(4 marks)**

$$2(x-1)3x + 8$$

d) Solve   **(3 marks)**

e) Find the gradient and the y-intercept of the line passing through A(2, 1) and B (-2, -3)   **(6 marks)**

Question Five

a) Find the equation of the tangent line to the curve $= x^2$ at x = 5   **(4 marks)**

b) Solve $4^x = 17$ **(4 marks)**

$$\log(x+4) + \log(x-2) = \log 7$$

c) Solve   **(3 marks)**

$$\log_3 54 - \log_3 2$$

d) Evaluate (i)   **(3 marks)**

$$2^{x+4} = 4^6$$

(ii)   **(3 marks)**

e) The population of a certain species of bacteria varies directly with temperature. When the temperature is 35°C the are 7 million bacteria:
How many millions of bacteria area there when the temperature is 38°C **(3 marks)**