TECHNICAL UNIVERSITY OF MOMBASA
FACULTY OF HEALTH AND APPLIED SCIENCES
DEPARTMENT OF MATHEMATICS AND PHYISICS
UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN MEDICAL LABARATORY SERVICES

AMA 1105: FOUNDATION MATHEMATICS

END OF SEMESTER EXAMINATION

SERIES: MAY SERIES

TIME: 2 HOURS

DATE: MAY 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of 5 questions. Attempt question one compulsory and any other two questions

Do not write on the question paper.

Question ONE (30 MARKS)

a. Define the following terms used in mathematics.

i. An equation (2 mks)

ii. Transposition (2 mks)

b. Transpose the formulae below to make r the subject of the formulae.

$$d = 2\{(h)(2r-h)\}^{\frac{1}{2}}$$ (3mks)

c. Derive the quadratic formulae and hence solve the equation below.

$6x^2 - 8x - 9 = 0$ (8 mks)

d. Solve for the unknowns in the set of equations below.

$$\frac{c+1}{4} - \frac{d+2}{3} + 1 = 0$$
$$\frac{1-c}{5} + \frac{3-d}{4} + \frac{13}{20} = 0$$

(7mks)

e. Solve for x below.

$\log_3 16 + 2\log_3 x = \log_3 64$ (3 mks)

f. Solve the following equation using completing the square.

$X^2 - 6x - 4 = 0$ (5mks)

Question TWO (20 MARKS)

a. determine the slopes of the following graphs at the value of x indicated

i. $y = 3x^2 + 4$ at $x = 1.2$

ii. $y = x^4 + 5x^3 - 6x^2 + 7x - 3$ at $x = -2$

iii. $y = 2x^3 + 4x^2 - 2x + 7$ at $x = 2$ (9mks)

b. differentiate the following factions with respect to x

i. $y = 5x^2 \sin x$ **(**4 mks**)**

ii. $y = \frac{\ln x}{x^3}$ **(**4 mks**)**

c. Find $\int (8x^3 - 3x^2 + 4x - 5)dx$ (3 mks)

Question THREE (20 MARKS)

a) Simplify the expression

K=2.76 × (8.45 + 3.14)+ 3.45^2 -4.89 ÷2.18 (3mks)

b) solve for the unknown

(i). $\frac{1}{3a-2}+\frac{1}{5a+3}=0$ (3mkS)

(ii). $\frac{3\sqrt{t}}{1-\sqrt{t}}=-6$ (3mks)

(iii). $\frac{2y}{5}+\frac{3}{4}+5=\frac{1}{20}-\frac{3y}{2}$ (3mks)

c) Solve following quadratic equation

i. By completing square

$2x^2 + 9x + 8 = 0$ (4 mks)

i. By factorization

$3x^2 – 11x - 4 = 0$ (4mks)

Question FOUR (20 MARKS)

a) Given that $x^2 = 3$

Find x (4mks)

b) solve for x

i. $4^{2x-1} = 5^{x+2}$ (4 mks)

ii. $2^{x+1} = 3^{x-1}$ (4 mks)

iii. $X^{1.5} = 14.91$ (3mks)

c) $\frac{1}{(4\frac{}{7} \times 2\frac{1}{4})} \div \left(\frac{1}{3} + \frac{1}{5}\right) + 2\frac{2}{24}$ (3mks)

d) $\frac{(2^4)^2 \times 3^{-2} \times 4^4}{2^3 \times 16^{\frac{1}{2}}}$ (2mks)

Question FIVE (20 MARKS)

a) A water tank is the shape of a rectangular prism having lenghth 2m, breadth 75cm and height 50 cm.determine the capacity of the tank in
   - **i.** m^3
   - **ii.** cm^3
   - **iii.** litres (6mks)

b) Determine the area of the circles having
   - i. Radius of 4 cm
   - ii. Diameter of 30 mm
   - iii. Circumference of 200 m (7 mks)

c) Calculate area of the shaded template

(4mks)

d) If paving slabs are produced in 250mm by 250mm square. Determine the number of slabs required to cover an area of $2m^2$ (3mks)