UGANDA INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

END OF SEMESTER II EXAMINATIONS

DEPARTMENT	:	**ICT**
YEAR	:	**TWO**
SEMESTER	:	**TWO**
PROGRAM	:	**HIGHER EDUCATION CERTIFICATE (BUSINESS)**
COURSE	:	**FOUNDATIONAL MATHEMATICS**
COURSE CODE	:	**HECPM123**
DATE	:	**SUNDAY, JULY 7, 2024**
TIME	:	**09:00 AM – 12:00 NOON**
DURATION	:	**3 Hours**

INSTRUCTIONS

- The paper consists of two Sections A and B
- Answer **ALL** questions in Section A and **ANY THREE** questions in Section B
- Credit will be given to relevant examples and illustrations
- Don Not Write anything on this question paper

SECTION A

Question one

(a) Evaluate the following

(i) $\frac{1}{3}+\frac{1}{2}$ (03marks)

(ii) $7\frac{1}{8}-5\frac{3}{7}$ (05marks)

(b) A certain course in UICT has 375 students of which 120 are girls. Express the number of girls as a fraction in its simplest form. (03marks)

(c) Express the following numbers as percentages

(i) $\frac{3}{4}$ (03marks)

(ii) 0.37 (03marks)

(d) If 9 litres of milk cost Ush 18,000. Calculate the cost of 24 litres of the same milk (04marks)

(e) If y is inversely proportional to x and y=15.3 when x=0.6, determine

(i) Coefficient of proportionality (03marks)

(ii) Value of y when x=1.5 (02marks)

(iii) Value of x when y=27.2 (02marks)

(f) Simplify the following

(i) $5x+3y+z-3x-4y$ (03marks)

(ii) $3xy-7x+4xy+2x$ (03marks)

(g) Expand the following

(i) $(x+2)(x+3)$ (03marks)

(ii) $(2x-3)(2x+3)$ (03marks)

SECTION B

Question two

(a) Evaluate the following

(i) $7+20\div(9-5)$ (03marks)

(ii) $1\frac{1}{3}x\,2\frac{1}{5}\div\frac{2}{5}$ (04marks)

(b) Simplify

(i) $\frac{3}{4}-\frac{7}{15}$ (03marks)

(ii) $1\frac{5}{8} - 2\frac{1}{3} + 3\frac{5}{6}$ (04marks)

(c) The surface area of a sphere is given by $A = 4\pi r^2$. Find the area of a circle of radius $r = 2.45m$, correct to 2 decimal places. (03marks)

(d) A metal rode, 150cm long, is heated and its length expands by 12cm. calculate the percentage increase in length (03marks)

Question three

(a) Simplify and evaluate each of the following

(i) $\frac{a^5 b\, c^3}{a^2 b^3\, c^2}$ when $a = \frac{3}{2}$, $b = \frac{1}{2}$ and $c = \frac{2}{3}$ (05marks)

(ii) $\left(a^{\frac{3}{2}} b\, c^{-3}\right)\left(a^{\frac{1}{2}} b^{-\frac{1}{2}} c\right)$ when $a = 3$, $b = 4$ and $c = 2$ (05marks)

(b) Evaluate $3pqr^3 - 2p^2qr + pqr$ when $p = \frac{1}{2}$, $q = -2$ and $r = 1$ (04marks)

(c) If x is inversely proportional to y and x=12 when y=0.4, determine

(i) The value of x when y=3 (03marks)

(ii) Value of y when x=2 (03marks)

Question four

(a) Solve the following equations

(i) $5(t-2) - 3(4-t) = 2(t+3) - 40$ (03marks)

(ii) $\frac{3}{2x+1} = \frac{1}{4x-3}$ (04marks)

(b) Solve the equations the following

$$3x - 2y = 12$$
$$x + 3y = 30$$

(05marks)

(c) Solve the following quadratic equations

(i) $x^2 + x - 6 = 0$ (04marks)

(ii) $3x^2 - 110x - 4 = 0$ (04marks)

Question five

(a) Write the following as the logarithm of a single number

(i) $3\log 2 + 2\log 5 - \frac{1}{2}\log 16$ (05marks)

(ii) $3\log 3 + \frac{1}{4}\log 16 - \frac{1}{2}\log 27$ (05marks)

(b) Solve the following equations

(i) $\log(x+1) + \log(x-1) = \log 3$ (05marks)

(ii) $\log(x^2 - 5) - \log x = \log 4$ (05marks)

Question six

(a) Determine the gradient of the straight line passing through (2,7) and (-3,4) (04marks)

(b) Determine the gradient and intercept on the y-axis for each of the following equations

(i) $y = 4x - 2$ (04marks)

(ii) $2y - 1 = 4x$ (04marks)

(c) Find the value of $\frac{dy}{dx}$ for the curve $y = x^2 + x - 4$ at the point $(1, -2)$ (04marks)

(d) E valuate $\int_1^3 (\mathbf{x^2} - 4x + 3)dx$ (04marks)

END