EASTERN UNIVERSITY, SRI LANKA
FACULTY OF COMMERCE AND MANAGEMENT
FIRST YEAR FIRST SEMESTER EXAMINATION IN BACHELOR OF BUSINESS ADMINISTRATION (HONOURS)/ BACHELOR OF COMMERCE (HONOURS)
2018/2019-[REPEAT]
[JANUARY/FEBRUARY 2022]

COM 1012 FINITE MATHEMATICS

ANSWER ALL QUESTIONS. **TIME: 02 HOURS**

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01. I) Factor completely the following expressions:

a) $18x^2 + 33x + 216$; b) $x^3y - xy^3$;

c) $64x^3 - y^3$.

(08 Marks)

II) Simplify the following expressions:

a) $x\{3(x+2)^2 - 5[2x(x-5)]\}$; b) $\dfrac{\left(\dfrac{4x^a y^{(b-1)}}{y}\right)}{\left(\dfrac{4x^{(a-1)}y^b}{x}\right)}$;

c) $\dfrac{x+2}{x^2-4} + \dfrac{x+2}{x^3+8} - \dfrac{1}{2-x}$.

(08 Marks)

III) Solve the following equations:

a) $4x^2 + 4x - 3 = 0$; b) $8^{(x-2)} = 2 \times 4^{(x-2)}$;

c) $\sqrt[3]{x-8} = 3$.

(09 Marks)
(Total Marks 25)

02. I) a) A particular item is sold at a price of Rs. $\left(\frac{200}{q} + 1\right)$ per unit, where q denotes the number of units. Find the minimum number of units that must be sold in order to get the sales revenue greater than Rs. 2000.

b) The demand and supply functions for a commodity are given by the equations:

$$P_d = -(Q+4)^2 + 100; \;\; P_s = (Q+2)^2,$$

where P is the price per unit and Q is the number of units. Find the equilibrium price and quantity.

(10 Marks)

II) A small bake house making cookies has fixed costs at Rs.5,000 per week. Each cookie costs Rs. 15 to make and is then sold for Rs. 35. Suppose x number of cookies are made.

a) Write equations for the

total cost function;
total revenue function;
total profit function.

b) Graph the total cost function and the total revenue function on the same diagram.

c) From the graph,

determine the break-even point;
the profit when 300 cookies are sold.

(15 Marks)
(Total Marks 25)

03. I) Given the matrices

$$A = \begin{pmatrix} 1 \\ 2 \\ -2 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & 2 & 0 \\ 0 & 1 & -1 \end{pmatrix}, \quad C = \begin{pmatrix} 1 & 0 \\ 2 & -5 \\ -1 & 1 \end{pmatrix}$$

determine the following:

a) $B^T + 2C$; b) BC; c) $A^T B^T$.

(12 Marks)

II) If the matrices $A = \begin{pmatrix} 3 & 2x \\ -y & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 8 \\ 9 & 7 \end{pmatrix}$ are equal, find the values of x and y.

(03 Marks)

III) Solve the given system of equations using the inverse matrix method.

$$x + y + z = 6$$
$$x + 2y + 3z = 14$$
$$-x + y - z = -2.$$

(10 Marks)
(Total Marks 25)

04. I) Let E and F be two events such that $P(E) = 0.40, P(F) = 0.35$, and $P(E \cup F) = 0.55$. Find $P(E \cap F)$.

(03 Marks)

II) Suppose two events are independent. One event has probability 0.25, while the other has probability of 0.59.

a) Find the probability that both events happen.
b) Find the probability of the union of these two events.
c) Find the probability that neither events happen.

(09 Marks)

III) A company tenders for 2 projects, A and B. It has a 30% chance of success of A, and a 20% chance of succeeding with B. The chance of the company getting both projects is 10%. Find the probability that

a) the company fails to get either project;
b) the company is successful with A given that it is successful with B.

(06 Marks)

IV) A manufacturing firm produces steel pipes in three plants with daily production volume of 500, 1000, and 2000 units respectively. According to the past experience, it is known that the fractions of defective outputs produced by three plants are 0.005, 0.008, and 0.010 respectively. If a pipe is selected at random from a day's total production and found to be defective, find out the probability that it has come from the first plant.

(07 Marks)
(Total Marks 25)