Uva Wellassa University

Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and Management

FIRST YEAR SECOND SEMESTER EXAMINATION – JANUARY / FEBRUARY 2016

EMG 243-2 Business Mathematics

Instructions to candidates:

No. of pages : Three (03)
No. of questions : Four (04) Essay Questions
Time : Two (02) Hours
Marks allocated : Hundred (100) Marks

Calculators are allowed.

Answer all questions

1.

a. Let $A = \begin{pmatrix} 2 & 4 \\ 0 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 4 & 3 \\ 0 & 6 \end{pmatrix}$, find;

i. $A + B$ (05 marks)
ii. 3A (05 marks)
iii. transpose of matrix A (03 marks)
iv. inverse of matrix B (05 marks)

b. Use **Gauss-Jordan elimination method** to solve the following system of linear equations. (12 marks)

$$x_1 + x_2 + x_3 = 1$$

$$3x_1 + 5x_2 + 3x_3 = 4$$

$$4x_1 + 3x_2 - x_3 = 6$$

(Total-30 marks)

2.

a. Find each of the following limits.

i. $\lim_{x \to 1}(x^2 + x + 2)$ (02 marks)

ii. $\lim_{x \to -2} \frac{x^2 + 9x + 14}{x + 2}$ (03 marks)

iii. $\lim_{x\to\infty}\frac{-x^{25}+3x^2+1}{x^{25}+4x^{11}+3x+1}$ (03 marks)

b. For each of the following y, find $\frac{dy}{dx}$.

i. $y = x^{2016} - x^{2015}$ (03 marks)

ii. $y = x(x-1)$ (04 marks)

iii. $y = \frac{x-1}{x+1}$ (04 marks)

c. Perform the following integration:

i. $\int(x^7 - 3x + 2)dx$ (03 marks)

ii. $\int\frac{x^{2016}+1}{x^{2015}}dx$ (03 marks)

(Total-25 marks)

3.

a.

i. Find the critical points of the function; $y = x^2 + 2x - 3$. (06 marks)

ii. Investigate the nature of each critical point either relative maximum or relative minimum by using first or second order derivative. (06 marks)

b. A company estimates that its daily total cost function (in suitable units) is $C(x) = x^3 - 6x^2 + 13x + 5$ and its total revenue function is $R(x) = 28x$. Find the value of x that maximizes the daily profit. (08 marks)

(Total-20 marks)

4.

a. Mr. Silva borrowed Rs. 10,000 on 01st January 2016 for 1 year at 8% simple annual interest.

i. What is the principle amount? (01 marks)

ii. What is the maturity date? (01 marks)

iii. Find the amount of interest. (04 marks)

iv. Find the maturity value. (05 marks)

b. Suppose Rs. 25,000 is invested at 7% compounded quarterly. How much money will be in the account after 5 years? (06 marks)

c. Ms. Chathurika deposits Rs. 22,000 at the end of each year for 7 years, in an account paying 5% interest, compounded annually. What is her account balance after 7 years? (08 marks)

(Total-25 marks)

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