

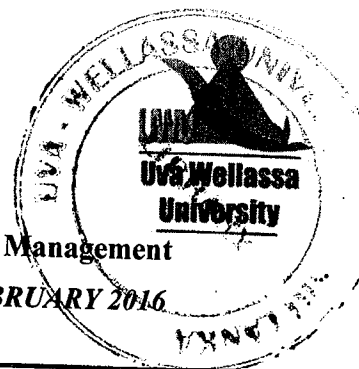
Uva Wellassa University

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

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

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

