Uva Wellassa University

Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and

Degree of Bachelor of Business Management in Hospitality, Tourism and Events Management

FIRST YEAR FIRST SEMESTER EXAMINATION – SEPTEMBER / OCTOBER 2015

ENM 161-2/HTE 161-2 Business Mathematics

Instructions to candidates:

No. of pages : Two (02)
No. of questions : Four (04) essay questions
Time : 02 Hours
Marks allocated : Hundred (100) Marks
Answer all questions

(01).

(a). Let $A = \begin{pmatrix} -2 & 4 \\ -1 & 5 \end{pmatrix}_{2\times2}$ and $B = \begin{pmatrix} 6 & 3 \\ 1 & 2 \end{pmatrix}_{2\times2}$

(i). Find product AB. (5 marks)

(ii). Find inverse of matrix **A** and Transpose of matrix **A** (5 marks)

(b). Solve the following system of linear equations using **Gauss-Jordan elimination method.**

$$x + 2y + 3z = 10$$
$$2x + y + z = 9$$
$$3x + y + 2z = 13$$

(15 marks)

(Total 25 marks)

(02).

(a). Find each of the following limits.

(i). $\lim_{x\to\infty} \frac{(x^2-9x-22)}{(x^5+2x+8)}$ (3marks)

(ii). $\lim_{x\to-1} \frac{(3x^5+7x^6+8)}{(9x+1)}$ (3marks)

(iii). $\lim_{x\to3} \left(\frac{(x^3-27)}{5x^2-13x-6}\right)$ (3 marks)

(b). Find $f'(x)$ of the following functions

(i). $f(x) = (x^5 - 2x)(2x^2 - 3x + 9)$ (3 marks)

(ii). $f(x) = \left(\frac{(x^7+4x^2+1)}{(x^3+3)}\right)$ (3 marks)

(c). Find all the critical points of the function $f(x,y) = 4 + x^3 + y^3 - 3xy$. (6 marks)

(d). Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ of the following functions.

(i). $y = e^{-8x} + 5x^6 + 3x^{-3}$ (2 marks)

(ii). $y = (2x^2 - 8x + 9)^2$ (2 marks)

(Total 25 marks)

(03).

(a). Let Total Cost (TC) and Total Revenue (TR) functions are $TC(x) = 3x + 8$ and $TR(x) = 60x - 0.5x^2$ respectively.

(i). What is the value of x which provide maximum profit? (4 marks)

(ii). What is the maximum profit? (2 marks)

(iii). Find the Marginal Revenue and Marginal Cost functions? (4 marks)

(b). Integration

(i). $\int (5e^{-4x} + 4x^6 + 6x^{-4} + 6)\, dx$ (5 marks)

(ii). $\int (8t + 3)^8 dt$ (5 marks)

(iii). $\int_0^2 (9x + 2)^4 dx$ (5 marks)

(Total 25 marks)

(04).

(a). You wish to invest Rs 3,500.00 for 7 years, how much will your investment be worth,

(i). If the simple interest rate $i = 15\%$. (2 marks)

(ii).If the interest rate $i = 15\%$compunded semiannually. (3 marks)

(b). An investor deposits Rs 10,000.00 under compound interest rate of 10%. How long it Will take to grow to Rs17,910.00 (5 marks)

(c). At the beginning of every year, Mr. Rathnayake deposits Rs 6000.00an account that earns 8% interest compounded annually. What is the balance at the end of the second year and end of third year separately? (5marks)

(d).Sehas takes out a loan of Rs 9000.00 and repays it with 15 equal yearly payments, the first one due at the time of the loan. Find the amount of each payment if i= 15%. (5 marks)

(e). Find the future value immediately after the last payment of an annuity, which pays Rs 2500.00 every 3 months for 20 years if the rate of interest is 5% convertible 4 times a year? (5marks)

(Total 25 marks)