

Uva Wellassa University

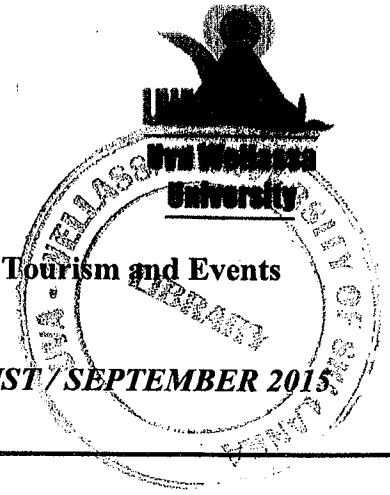
Faculty of Management

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

Management

SECOND YEAR FIRST SEMESTER EXAMINATION – AUGUST / SEPTEMBER 2015

HTE 231-2 Business Mathematics



Instructions to candidates:

- No. of pages : Two (02)
No. of questions : Four (04) essay questions
Time : 02 Hours
Marks allocated : 100 Marks
Attach the question paper with the answer script.

Answer all questions

(01).

(a). Find the Inverse and Transpose of matrix $A = \begin{pmatrix} 3 & -4 \\ -1 & 3 \end{pmatrix}_{2 \times 2}$ (10 marks)

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

$$\begin{aligned} x + y + z &= 5 \\ 2x + 3y + 5z &= 8 \\ 4x + 5z &= 2 \end{aligned} \quad (15 \text{ marks})$$

(Total 25 marks)

(02).

(a). Find $\frac{dy}{dx}$ of the following functions.

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

(ii). $y = \left(\frac{x^2 + 5x + 1}{x^2 + 3} \right)$ (3 marks)

(iii). $y = (4x^3 - 8x + 9)(2x + 9)$ (3 marks)

(b). Find each of the following limits.

(i). $\lim_{x \rightarrow -2} \frac{(x^2 - 9x - 22)}{(x + 2)}$ (3 marks)

(ii). $\lim_{x \rightarrow \infty} \frac{(x^6 - 3x^5 + 7x^4 + 8)}{(x^7 - 7x + 9)}$ (3marks)

(iii). $\lim_{x \rightarrow 2} \frac{(x^4 - 16)}{(x^2 + 3x - 10)}$ (3marks)

(c). Let $z = x^4 y^3 + 5x^2 y^2 + x^4 + y^7$, Find $Z_x, Z_y, Z_{xx}, Z_{yy}, Z_{xy}$. (7 marks)

(Total 25 marks)

(03).

(a). A company manufactures q number of output units of a product. The total Revenue (TR) is given by $TR(q) = 4000q - 33q^2$, Total Cost (TC) function is given by $TC(q) = 2q^3 - 3q^2 + 400q + 500$

(i). Find the profit function (2 marks)

(ii). Find the profit maximizing output level q (2 marks)

(iii). Find the maximum profit. (2 marks)

(iv). Find the Marginal Revenue (MR) and Marginal Cost (MC) which provide maximum profit.

(4 marks)

(b). Find the following Integrals

(i). $\int (e^{-4x} + 4x^3 + 6) dx$ (5 marks)

(ii). $\int (5x - 3)^7 dx$ (5 marks)

(iii). $\int_1^2 (2x + 3)^3 dx$ (5 marks)

(Total 25 marks)

(04).

(a). Rs 1000.00 is invested at annual interest rate of 8%. Compute the balance after 6 years, if the interest is compounded monthly? (5 mark)

(b). Suppose Rs 1600.00 is invested at 10% compounded continuously. How much money will be in the account after 10 years? (5 marks)

(c). At the end of every year, Mr. Perera deposits Rs 5000, in an account that earns 8% interest compounded annually. What is the balance at the end of the second year and end of third year separately? (5 marks)

(d). Seha takes out a loan of Rs 1000.00 and repays it with 10 equal yearly payments, the first one due at the time of the loan. Find the amount of each payment if $i = 16\%$ (5 marks)

(e). Find the future value immediately after the last payment of an annuity, which pays Rs 2500.00 every 2 months for 10 years if the rate of interest is 6% convertible 6 times a year? (5 marks)

(Total 25 marks)