Uva Wellassa University

Faculty of Management

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

100 LEVEL 1st SEMESTER EXAMINATION – JUNE / JULY 2017

HTE 161-2 Business Mathematics

Instructions to candidates:

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

Answer all questions.
Calculators are allowed.

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1. a. Let $A = \begin{pmatrix} 4 & 8 \\ 3 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} 5 & 2 \\ 3 & 4 \end{pmatrix}$ then find ;

   i. $A - B$ (2 Marks)

   ii. AB (3 Marks)

   iii. transpose of matrix AB (3 Marks)

   b. Let $P = \begin{pmatrix} 4 & 1 & 3 \\ 6 & 0 & 2 \\ 7 & 5 & 0 \end{pmatrix}$, find determinant of P, hence obtain the inverse of matrix P. (10 Marks)

   c. Solve the following system of linear equations using **Cramer's Rule** method.

$$2x + 3y = 6$$
$$5x + y = 2$$ (7 Marks)

2. a. Find each of following limits.

   i. $\lim_{x \to 1}(x+2)^2$ (3 Marks)

   ii. $\lim_{x \to 3} \frac{(x^6 - 729)}{(x-3)}$ (3 Marks)

   b. Differentiate the following functions with respect to x.

   i. $y = 2x^4 - 3x^2 + 5x - 2$ (2 Marks)

   ii. $y = \ln(2x^2 - 3x + 2)$ (2 Marks)

   iii. $y = \frac{(4x^3 - 5x^2 + 2x + 6)}{(4x+5)^3}$ (4 Marks)

   iv. $x^2 + 5xy - 3xy^2 + 2x - 3y = 7$ (6 Marks)

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c. Find the stationary points of the following function and obtain whether that point is a maximum or minimum, hence sketch the graph.

$y = 3x^3 - 5x^2 + 2x - 3$ (10 Marks)

3. a. Integrate the following functions with respect to relevant subject.

i. $\int (2u^4 + 3u^2 - \frac{1}{u} + 9)\, du$ (3 Marks)

ii. $\int (\ln t + e^{-5t} + 2t - 1)\, dt$ (3 Marks)

iii. $\int x \ln x \; dx$ (3 Marks)

b. Evaluate the values of following integrations.

i. $\int_{-1}^{1} (\frac{2}{x^3} + 4x^2 - 5e^{-2x} + \ln x + 1)\, dx$ (4 Marks)

ii. $\int_0^5 (11u^2 - 5u + 3)(e^{2u})\, du$ (6 Marks)

iii. $\int_0^1 (t^3 - 5t^2 + 2t + 7)\ln(t)\, dt$ (6 Marks)

4. a. Mr. Kamal takes a loan of Rs.800,000 to buy a used truck at the rate of 13.5 % simple interest per annum. Calculate the total amount to be paid for the loan amount to repay it from 6 years?

(4 Marks)

b. Mr. John borrowed Rs.8000 for 4 years to make home improvements. If he repaid a total of Rs.10320, at what interest rate did he borrow the money?

(4 Marks)

c. If you start a bank account with Rs.10,000 and your bank compounds the interest quarterly at an interest rate of 8%, how much money do you have at the year's end? (assume that you do not add or withdraw any money from the account)

(5 Marks)

d. Calculate the present value of an annuity-immediate of amount Rs.100 paid annually for 5 years at the rate of interest of 9%.

(7 Marks)