EASTERN UNIVERSITY, SRI LANKA
FACULTY OF COMMERCE AND MANAGEMENT
FIRST YEAR SECOND SEMESTER EXAMINATION IN
BACHELOR OF BUSINESS ADMINISTRATION/ BACHELOR OF COMMERCE
2017/2018(JANUARY 2020) – REPEAT
COM 1032 BASIC CALCULUS

Answer All Questions   **Time: 02 Hours**

01. (i)   Specify the domain of the function, $f(x)=x^3-3x^2+2x+5$

(ii)   If $f(x)=\sqrt{x^2+2x+4}$, then find $f(0)$.

(iii)   If $g(u)=u^2+4$ and $h(x)=x-1$ then find the composite function $g[h(x)]$.

(iv)   The total cost in rupees of manufacturing q units of a certain commodity is given by the function $C(q)=q^3-30q^2+400q+500$.

a) Compute the cost of manufacturing 10 units of the commodity?

b) Compute the cost of manufacturing the 10th unit of the commodity?

(v)   A manufacturer sells his product at Rs. 18/- per unit selling all he produces. His fixed cost is Rs. 1800/- per day and the variable cost is Rs. 12/- per unit. Let the number of units produced and sold per day be x.

a) Write down the total cost function in terms of x.

b) Write down the revenue function in terms of x.

c) Find the break-even point.

(25 Marks)

02. (i)   Evaluate the following limits:

a) $\lim\limits_{x \to 2} \dfrac{x^2-3x}{x+1}$

b) $\lim\limits_{x \to 1} \dfrac{x^3-8}{x-2}$

(ii)   Differentiate the following functions with respect to x:

a) $f(x)=(3x^4-5x)(8x^2+7x)$

b) $f(x)=(3x^2-4x+7)^8$

c) $f(x)=\dfrac{e^x+x}{\ln x}$

(iii)   Find the second derivative of the function $f(x)=x(2x+1)^2$.

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(iv)   Find $\dfrac{dy}{dx}$ if $x^2 y = 1$.

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(v)   The total cost function of a firm is given by $C(x) = 0.001x^3 - 0.24x^2 + 60x + 1200$, where
number of units produced. Find the marginal cost when 50 units are produced.

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03.   (i)   Find and classify all the critical points of the function $f(x) = 2x^3 + 3x^2 - 12x - 7$.   a

(ii)   Demand function for a manufacturer's product is $4x = 800 - p$ and the average cost fun   f

$AC(x) = 0.4x + 8 + \dfrac{800}{x}$, where x is the number of units and p the price per unit and A a

expressed in rupees.

   a)   Write down the total cost function, the total revenue function and the profit func
   b)   Find the level of output at which profit is maximized
   c)   Determine the price at which maximum profit occurs
   d)   Determine the maximum profit

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04.   (i)   Find the following indefinite integrals:

$a) \int x^2 \left(2x^2 + \dfrac{4}{x^2} - \dfrac{6}{x} - 2 \right) dx$ $b)\ \int \dfrac{e^{\sqrt{x}}}{\sqrt{x}}\, dx$

(ii)   Find the following definite integrals:

$\int\limits_{-2}^{2} \left(x^3 - \dfrac{1}{x^3} + 3 \right) dx$ $b)\ \int\limits_{0}^{1} \dfrac{x}{x^2 + 1}\, dx$

(iii)   A manufacturer has found that marginal cost is $3q^2 - 60q + 400$ rupees per unit when
have been produced. The total cost of producing the first two units is Rs. 900/-. Determi
total cost function.

(iv)   The marginal revenue function for a commodity is given by $MR(x) = 26 - 0.002x$, whe
the number of units sold. Find the revenue when 1000 items are sold.

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