Eastern University, Sri Lanka

Faculty of Commerce and Management

First Year First Semester Examination in Bachelor of Business Administration and Bachelor of Commerce - 2016/2017

(July-August 2018)

Proper/Repeat

COM 1013 Business Mathematics

Answer all questions **Time: Three Hours**

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1. (a) Simplify the following:

   i. $\dfrac{729(x^{-3}y^{-6})^{-6}}{9x^{18}y^{32}}$;

   ii. $(81y^4)^{1/4} \times (32x^{10})^{2/5} \div (8x^{-3})^{2/3}$.

   (b) Factorizing the following:

   i. $4x^2 + 12xy + 9y^2$;

   ii. $8p^3 - 27$.

   (c) Solve the following equations.

   i. $3^x \times 3^{3x+1} = 27$.

   ii. $2^{2x} \times 4^{3x-2} = 8^{-2x}$.

2. (a) Solve the following equations.

   i. $\log_a 25 = 2$.

   ii. $\log_2[\sqrt{x+6} - 2] = 0$.

   (b) If $4x^2 + y^2 = 40xy$ then show that $2\log\left(\dfrac{2x-4}{6}\right) = \log x + \log y$.

   (c) If you deposit Rs. 8000 into an account paying 10% annual interest compounded annually, how much money will be in the account after two years?

3. (a) Evaluate the following limits:

i. $\lim_{x\to 2} \dfrac{x^2-4}{x-2}$;

ii. $\lim_{x\to\infty} \dfrac{1+3x^2-7x^3-21x^4}{4+x^3+3x^4}$;

iii. $\lim_{x\to 0} \dfrac{\sqrt{1+x}-1}{x}$;

iv. $\lim_{x\to 1} \dfrac{x^3-1}{x-1}$;

v. $\lim_{x\to 3} \dfrac{x^2-9}{x^2-4x+3}$.

(b) Differentiate the following:

i. $y = x^2 - 3x + 2$;

ii. $y = \ln(x^2)$;

iii. $y = e^x \sin 2x$;

iv. $y = \dfrac{1-x}{1+x}$;

v. $y = \sqrt{x^2-1}$.

4. (a) Find the maximum and the minimum points of the curve $y = x^3 - 3x^2 - 4$.

(b) The cost function for x units of a product produced and sold by a company $C(x) = 250 + 0.005x^2$ and the total revenue is given as $R = 8x$. Find how ma items should be produced to maximize the profit. What is the maximum profi

5. (a) Find the value of the following integrations:

i. $\int (2x^5 + 5x)\, dx$;

ii. $\int \dfrac{1}{x \log x}\, dx$;

iii. $\int \dfrac{1-2x}{\sqrt{3+4x-4x^2}}\, dx$;

iv. $\int \dfrac{2x}{(3x^2+2)^2}\, dx$;

v. $\int \dfrac{x^3+4x^2}{x+1}\, dx$.

(b) The marginal cost function of producing x units of a product is given by $\dfrac{x}{\sqrt{x^2+360}}$ Find the total cost function and the average cost function if the fixed cost is Rs.1000.