UNIVERSITY OF JAFFNA
BACHELOR OF PHARMACY
SECOND YEAR FIRST SEMESTER EXAMINATION – JANUARY 2016
PHAMM 2101 PHARMACEUTICAL MATHEMATICS

Date: 26.01.2016. **Time: 01 Hour**

Answer all two questions.

[1]

a. Solve the following.

i. $log_6(x+4) + log_6(x-2) = log_6 4x$

ii. $6a - 3b = -10$

$3a + 5b = 8$

iii. $3(x+1)^2 + 5x = 6$ [15 Marks]

b. Differentiate the following equation **twice** with respect to θ.

$$k = e^{\theta} sin^2\theta - 4\ln\theta$$ [10 Marks]

c. The velocity of dengue spreading from the South to the North in Sri Lanka is given by

$$\dot{x} = 8 - 8e^{-2t}$$

; where t is the time in days and x is the displacement in kilometres.

i. Show that initially the rate was zero.

ii. Show that the acceleration of the spreading rate is always in positive. [20 Marks]

[2]

a. Evaluate the limit.

i. $\lim_{x\to 2} \frac{x^3-8}{x-2}$

ii. $\lim_{\theta\to 0} \frac{5\,Sin\,2\theta}{Sin\theta}$ [10 Marks]

b. Let $y = e^{2ax} + \frac{1}{2}b(x+2)^3$. When $x = 0$, suppose that $\frac{dy}{dx} = 0$ and $\frac{d^2y}{dx^2} = 0$. Find the possible values of $a$and b. [20 Marks]

c.

i. Integrate $\int a \sin^4 x \; dx$; where a is a constant.

ii. Evaluate the integral $\int_0^2 (x+2)^3(x+5)dx$. [25 Marks]

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