



Code No. : **4404**

FACULTY OF PHARMACY
B. Pharmacy I Year (Supplementary) Examination, Nov./Dec. 2010
MATHEMATICS

Time : 3 Hours]

[Max. Marks : 70]

*Note : Answer all questions. All questions carry **equal** marks.*

1. a) If $\log_y [1 + \log_b [+ \log_c x]] = 0$, find x.

b) If $\sin a = \frac{41.0}{\sqrt{5}}$ and a, p are acute then find $a + p$

OR

c) Prove that $\sin A \sin \frac{A}{3} + \sin \frac{A}{3} \sin \frac{A}{3} = \frac{1}{4} \sin 3A$. Hence show that

$$\sin^{-1} \frac{\sin \theta_{27}}{9} \sin \theta_{37} \bigg| \sin \theta_{4e} \frac{3}{9} \frac{1.6}{1.6}$$

d) If $x = 1 + \log_a bc$, $y = 1 + \log_b ca$, and $z = 1 + \log_c ab$, prove that $xyz = xy + yz + zx$

2. a) Show that $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2$.

b) Find the maximum and minimum values of $f(x) = x^3 + \frac{3}{x}$

OR

c) If $u = \begin{pmatrix} x & y & z \\ y & z & x \end{pmatrix}$, show that $x \frac{\partial}{\partial x} + y \frac{\partial}{\partial y} + z \frac{\partial}{\partial z} u = 0$.

d) Prove that $x^3 - 3x^2 + 3x + 7 = 0$, has neither maximum nor minima.

(This paper contains 3 pages)

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3. a) Evaluate $\int \frac{1}{x(1+\log x)} dx$

b) Evaluate $\int \frac{x \cos x}{(1+x)^2} dx$

OR

c) Evaluate $\int \frac{\sin x}{x + \cos x} dx$

d) Evaluate $\int \frac{\sin x \cos x}{1 + \sin^4 x} dx$

4. a) Define Rank of the matrix and hence find the rank of the matrix,

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ 3 & 6 & 9 & 12 \end{bmatrix}$$

b) Solve the system of equations

$2x - y + 8z = 13$; $3x + 4y + 5z = 18$ and $5x - 2y + 7z = 20$ by Gaussian elimination method.

OR

c) Solve the system of equations

$x + 2y + 3z = 4$, $2x + 3y + 5z = 5$, $3x + 4y + 6z = 12$ by matrix inversion method.

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