1111111111111111 Code no.: 6504/M

FACULTY OF PHARMACY
B.Pharmacy 1 Year (Main) Examination, June 2012
MATHEMATICS

Time : 3 Hours] [Max. Marks : 70

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

1. a) 1) If $ax = by = cz$ and $y^2 = 2x$, prove that $\log_b a = \log_c b$.

2) Prove that $A + B = 45° \Leftrightarrow (1 + \tan A)(1 + \tan B) = 2$. Hence show that

$$\tan 22\frac{1}{2}° = $$

OR

b) 1) If $(3.4)^x = (0.034)^Y = 10000$ find the value of $\frac{1}{x} - \frac{1}{y}$

2) In a triangle ABC, prove that

$\sin 2A + \sin 2B - \sin 2C = 4 \cos A \cos B \sin C$.

2. a) 1) Prove that $\lim_{x \to 3} \frac{x^3 - 8x^2 + 45}{2x - 3x} = \frac{7}{9}$

2) Find $\frac{dy}{dx}$. $x = a \cos t\theta$, $y = b \sin \theta$.

OR

b) 1) Using first principle find the derivative of $\sin x$.

2) Find the maximum and minimum values of $f(x) = x^3 - 6x^2 + 9x + 15$.

3. a) 1) Evaluate $\int \frac{dx}{3 + 5x - 2x^2}$

2) Evaluate $\int \frac{2x + 3}{3x^2 + 14x - 5} dx$

OR

b) 1) Evaluate $\int \frac{dx}{5 + 4 \cos x}$

2) Evaluate $\int \frac{1}{(2x + 3)\sqrt{x + 2}} dx$

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4. a) 1) If $A = \begin{vmatrix} 6 & 2 & -2 \\ -2 & 2 & 2 \\ 2 & 2 & 2 \end{vmatrix}$ show that (A - 21) (A - 41) = 0.

2) Find the rank of $\begin{vmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 2 & 1 \end{vmatrix}$

OR

b) 1) Show that $\begin{vmatrix} b+c & c+a & a+b \\ a+b & b+c & c+a \\ a & & \end{vmatrix} = a^3 + b^3 + C^3 - 3abc$

2) If $A = \begin{bmatrix} 2 & 0 \\ & 5 \\ 3 & \end{bmatrix}$ show that $A^2 + 3A - 10I = 0$.

5. a) 1) Find the equation of line passing through the point (2, -3) and having intercepts whose ratio is 3 : 2.

2) Show that the points (- 6, 0) (-2, 2), (-2, - 8) and (1, 1) are concylic.

OR

b) 1) Find the equation of line dividing the line segment joining (2, 3), (4, - 5) in the ratio 2 : 3 and having slope - 3.

2) Find the circle which passes through (-1, 2), (- 4, 5) and has its centre on the line x 2y = 0.