

Pharmacy, Hyderabad

FACULTY OF PHARMACY
B. Pharmacy I-Year (Main) Examination, June 2015
Subject : Mathematics
Time : 3 Hours
Max. Marks: 70
Note: Answer all questions. All questions carry equal marks.

- 1 (a) Prove that $\log(a \cdot b) = \log a + \log b$.

(b) If $\frac{\tan 26^\circ + \tan 19^\circ}{x(1 - \tan 26^\circ \tan 19^\circ)} = \cos 60^\circ$, then find the value of x .

OR

- (c) If $\sec A + \tan A = P$, then find $\sin A$.

(d) If $a = \log_{24} 12$, $b = \log_{36} 24$ and $c = \log_{48} 36$, then. Find $1 + abc$.

- 2 (a) Find the $\lim_{x \rightarrow 0} \frac{1 - \cos 4x}{1 - \cos 2x}$

(b) If $u = \sin^{-1} \left(\frac{x^2 + y^2}{x + y} \right)$ show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$.

OR

- (c) Find differentiation of $\sin x$ from the first principle.

(d) Find $\lim_{x \rightarrow 0} \frac{\sin x - \tan x}{x}$

- 3 (a) Evaluate $\int \frac{x^5}{1 + x^{12}} dx$

(b) Find the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.

OR

(c) Evaluate $\int \frac{3x + 7}{3x^2 + 14x - 5} dx$

(d) Show that the area of a loop of the curve $y^2 = x^2(4 - x^2)$ is $\frac{16}{3}$.

- 4 (a) If a, b, c are different and the determinant

$$\begin{vmatrix} a & a^2 & a^3 - 1 \\ b & b^2 & b^3 - 1 \\ c & c^2 & c^3 - 1 \end{vmatrix} = 0 \text{ then prove that } abc = 1.$$

- (b) Solve $x + 4y - 2z = 3$, $3x + y + 5z = 7$, $2x + 3y + z = 5$ by Gauss elimination method.

OR

- (c) Solve $3x + y - z = 0$, $5x + 2y - 3z = 2$, $15x + 6y - 9z = 5$ by Gauss elimination method.

- (d) Define determinant of a matrix and find A^{-1} if

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 4 \\ 4 & 1 & 3 \end{bmatrix}$$

- 5 (a) Define linear and non-linear graphs with an example to each.

(b) Find the centre and radius of the circle $x^2 + y^2 + 4x + 6y + 4 = 0$.

OR

(c) Find the focus, vertex of the parabola $y^2 = 5x + 4y + 1$.

(d) Find the distance between the points $(-1, 1)$ and $(2, 3)$.
