

FACULTY OF PHARMACY**B. Pharmacy I – Year (Non-CBCS)(Backlog) Examination, August 2019****Subject : Mathematics****Time : 3 hr s****Max. Marks : 70****Note : Answer all questions. All questions carry equal marks.**

1 a) i) Find the solution of the equation $10^{x+3} = 6^{2x}$.

ii) If $\tan 35^\circ = K$ then the value of $\frac{\tan 145^\circ - \tan 125^\circ}{1 + \tan 145^\circ \cdot \tan 125^\circ}$.

OR

b) i) $\log 2^x + \log 2^{(x-2)} = 3$.

ii) if $\tan a = \frac{1}{3}$ and $\tan b = \frac{1}{7}$ then show that $\tan (2\alpha + \beta) = 1$.

2 a) i) Find the derivative of $\tan x$ using first principle.

ii) Show that the function is not differentiable at 2 where

$$f(x) = \begin{cases} x; 0 \leq x \leq 2 \\ 2; x \geq 2 \end{cases}$$

OR

b) i) Find the maximum and minimum values of the polynomial
 $f(x) = x^3 - 4x^2 + 8x - 6$

ii) If $u = xy f\left(\frac{y}{x}\right)$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 2u$.

3 a) i) Evaluate $\int \frac{1}{3+5x-2x^2} dx$ ii) $\int \frac{1+\sin^2 x}{1+\cos^2 x} dx$

OR

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

ii) Evaluate $\int \frac{2x+6}{x^2+3x-6} dx$

4 a) i) If $A = \begin{bmatrix} a^2 & ab & ac \\ ab & b^2 & bc \\ ac & bc & c^2 \end{bmatrix}$ and $a^2 + b^2 + c^2 = 1$ then find A^2 .

ii) Solve the equation $7x + 5y - 13z + 4 = 0$, $9x + 2y + 11z - 37 = 0$,
 $3x - y + z = 2$ by matrix inversion method.

OR

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b) i) Find the rank of the matrix $A = \begin{bmatrix} 1 & -1 & 2 & 3 \\ 2 & 2 & 3 & 4 \\ 3 & 4 & 5 & 6 \end{bmatrix}$

ii) If $A = \begin{bmatrix} 0 & 2 & 1 \\ -2 & 0 & -2 \\ -1 & x & 0 \end{bmatrix}$ is a skew symmetric matrix, then find the value of x.

- 5 a) i) Find the equation of circle passing thrgh the points (1, 0) (0, 1) (1, 1).
ii) Find the equation of the line having intercepts a and b on the axes such that $a + b = 3$ and $ab = 1$.

OR

- b) i) Write the basic mathematical principles are used in Biological testing.
ii) Find the equation of circle passing thrgh (-7, 1) and having centre at (-4, -3).

