

FACULTY
Pharm D (6 – YDC) I – Year (Main & Backlog) Examination, July 2018
Subject: Remedial Mathematics
Time: 3 Hours
Max.Marks: 70
Note: Answer all questions from Part – A. Any Five questions from Part – B.
PART – A (10x2 = 20 Marks)

1 If $A = \begin{bmatrix} 1 & -1 \\ 0 & 3 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, find AI .

2 If $\begin{bmatrix} 0 & 2a \\ 3b & 0 \end{bmatrix} = \begin{bmatrix} 0 & 6 \\ 9 & 0 \end{bmatrix}$ then find a and b .

3 Find the slope of the joining points (x_1, y_1) and (x_2, y_2) .

4 Find the center and radius of $(x-a)^2 + (y-b)^2 = r^2$.

5 Evaluate $\int_0^{\pi/2} \sin x \, dx$.

6 Find the order and degree of differential eqn.

$$y'' + (y')^2 + 5y = x^2.$$

7 Solve $x^2 dx + \frac{1}{y} dy = 0$.

8 Find $\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x - 1}$.

9 Find the Laplace transform of $f(t) = t^3 + e^{-t}$.

10 Find $\frac{\partial u}{\partial x}$ and $\frac{\partial u}{\partial y}$ if $u(x, y, z) = x^2 + xyz$.

PART – B (5x10 = 50 Marks)

11 a) If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ then find $(\sin q)A + (\cos q)B$.

b) Show that $\begin{vmatrix} a^2 + 2a & 2a + 1 & 1 \\ 2a + 1 & a + 2 & 1 \\ 3 & 3 & 1 \end{vmatrix} = (a-1)^3$.

12 a) If $(A+B) = \pi/4$ then prove that $(1+\tan A)(1+\tan B) = 2$.

b) If $\sin A = \frac{12}{13}$ and $\cos B = \frac{3}{5}$ then find $\sin^2 A + \cos^2 A$ and $\sin^2 B + \cos^2 B$.

- 13 a) Find the radius and center of the circle $x^2 + y^2 + 2ax - 2by + b^2 = 0$.
b) Find the coordinates of vertex and focus and directors of the parabola $y^2 = 25x$.
- 14 a) If $\lim_{x \rightarrow 1} \frac{ax^2 + x + 5}{x - 2} = 3$ then find value of a.
b) If $u = \sin^{-1} \left[\frac{x^3 - y^3}{x + y} \right]$ then find $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$.
- 15 a) Evaluate $\int_1^2 \log x \, dx$.
b) Evaluate $\int_0^{p/4} \frac{x \tan^{-1} x}{1 + x^2} \, dx$.
- 16 a) Solve $\frac{dy}{dx} = \frac{1 + y^2}{1 + x^2}$.
b) Solve $\frac{dy}{dx} = e^{ax+by}$.
- 17 a) Find the Laplace transform of $e^t \cos^2 t$.
b) Show that $L[af(t)+bg(t)] = aL[f(t)] + bL[g(t)]$.
- 18 a) Show that $\lim_{x \rightarrow 2} \frac{\tan(x-2)}{x^2 - 4} = \frac{1}{4}$.
b) Evaluate $\int_0^2 x^2 e^x \, dx$.
