

FACULTY**Pharm D (6-YDC) I – Year (Instant) Examination, March 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 $A = \begin{bmatrix} -2 & 1 \\ 5 & 0 \\ -1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 3 & 1 \\ 4 & 0 & 2 \end{bmatrix}$ then find $A + 2B'$.
- 2 Find the distance between $(a \cos a, a \sin a)$ and $(0, 0)$.
- 3 If $\sin A = \frac{3}{5}$ then find $\cos A + \tan A$.
- 4 Find the $\frac{dy}{dx}$ if $y = (ax+b)^n$.
- 5 Find $\int \log x \, dx$.
- 6 Find the order and degree of differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y = x^2$.
- 7 Find Laplace transform of $e^t \sin t$.
- 8 Find the center and radius of the circle $3x^2 + 3y^2 - 6x + 12y + 3 = 0$.
- 9 Find the $\lim_{x \rightarrow 2} \frac{x^4 - 2^4}{x^2 - 2^2}$.
- 10 If $Z = yx^2z + xy^2$ then find $\frac{\partial Z}{\partial x}$ and $\frac{\partial Z}{\partial y}$.

PART – B (5x10 = 50 Marks)

- 11 a) Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$.
- b) If $\begin{bmatrix} 2x+1 & 0 \\ 2y+4 & 0 \end{bmatrix} = \begin{bmatrix} 3 & 0 \\ 8 & 0 \end{bmatrix}$ then find x and y .
- 12 a) If $\tan A = \frac{5}{12}$ then find $\tan (A+B)$.
- b) If $x = r \cos \theta \cos \alpha$, $y = r \cos \theta \sin \alpha$ and $z = r \sin \theta$ then find $x^2 + y^2 + z^2$.

- 13 a) Find the equation of the circle passing through (0, 0), and having center at (-4, -3).
b) Find the vertex and focus of $4y^2 + 12x - 20y + 67 = 0$.

14 a) Find $\lim_{x \rightarrow 1} \frac{\tan(x-1)}{x^2-1}$.

- b) Using Euler's theorem show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{2} \tan u$ for the function

$$u = \sin^{-1} \left(\frac{x+y}{\sqrt{x} + \sqrt{y}} \right)$$

15 a) Evaluate $\int \frac{c^x(1+x)}{\cos^2(xe^x)} dx$.

b) Evaluate $\int_0^p \frac{1}{1+\sin x} dx$.

16 a) Solve $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$.

b) Solve $(x^3 - 3xy^2) dx + (3x^2y - y^3) dy = 0$.

17 a) Find the Laplace transform of $e^{-2t} + t^2 - \cos 3t$.

b) Find the Laplace transform of $e^t \cos^2 t$.

18 a) Solve $\cos^2 x \frac{dy}{dx} + y = \tan x$.

b) If $x^3 + y^3 = 3axy$ then prove that $\frac{d^2y}{dx^2} = -\frac{2a^2xy}{(y^2 - ax)^3}$.
