

Code No. 6117

FACULTY
Pharm D (6 – YDC) I – Year (Main / Backlog) Examination, August 2016
Subject: Remedial Mathematics
Time: 3 Hours
Max.Marks: 70
Note: Answer all questions from Part – A. Answer any Five questions from Part – B.
PART – A (10x2 = 20 Marks)

- 1 If $A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ -1 \\ 2 \end{bmatrix}$, find AB^T .
- 2 If $\begin{vmatrix} -2 & 5 \\ 6 & x \end{vmatrix} = 0$, find x.
- 3 Find the slope of the line joining points (1, 2) and (-3, -4).
- 4 Find the centre and radius of the circle $x^2 + y^2 - 6x + 1 = 0$.
- 5 Evaluate $\int_0^1 x e^x dx$.
- 6 Find the order and degree of differential equation $\left(\frac{d^2y}{dx^2}\right)^2 + \frac{dy}{dx} + y = 0$.
- 7 Find $\lim_{x \rightarrow 2} \frac{x^2 - 1}{x - 1}$.
- 8 Solve $y dx + x dy = 0$.
- 9 Find the Laplace transform of $5e^{2t} + e^{5t}$.
- 10 If $z = x^2 + \log(1 + y^2)$, find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$.

PART – B (5x10 = 50 Marks)

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

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13 a) Find the equation of the circle passing through (3, 4), (3, 2) and (1, 4).

b) Find vertex and focus of $x^2 - 6x - 6y + 6 = 0$.14 a) Show that $\lim_{x \rightarrow 1} \frac{\sin(x-1)}{x^2-1} = \frac{1}{2}$.b) If $u = \sec^{-1} \left(\frac{x^3 - y^3}{x + y} \right)$, then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 2 \cot u$.15 a) Evaluate $\int_0^{1/2} \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$.b) Evaluate $\int_0^{\pi/3} \frac{\cos x}{3 + 4 \sin x} dx$.16 a) Solve $\frac{dy}{dx} + y \tan x = \sin x$.b) Solve $\frac{dy}{dx} = \frac{y}{xy + x}$.17 a) Find the Laplace transform of $e^{2t} + 4t^3 - 2 \sin 3t$.b) Find the Laplace transform of $e^{-t} \sin^2 t$.18 a) Solve $\frac{dy}{dx} = \frac{\log x + 1}{\sin y + y \cos y}$.b) If $\lim_{x \rightarrow \frac{\pi}{2}} x(1 + a \sin x) = 1$, then find 'a'.
