Code No. 6179

FACULTY

Pharm. D. (6 YDC) I-Year (Instant) Examination, February 2020

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 $A = \begin{bmatrix} 3 & -1 & 2 \\ 3 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 & 6 \\ 1 & 3 & -1 \end{bmatrix}$ find 2A - 3B.

2. If $\begin{vmatrix} x & 12 \\ 12 & x \end{vmatrix} = 0, \; find \; x$.

3. Find the distance between the points $(0, -2)$ and $(-1, 0)$.

4. Find the centre and the radius of the circle $x^2 + y^2 - 4x - y - 5 = 0$.

5. Evaluate $\int Tan \; x \; dx$.

6. Find the order and degree of the differential equation $a^2 \dfrac{d^2 y}{dx^2} = 1 + \left(\dfrac{dy}{dx}\right)^2$.

7. Find $\lim\limits_{x \to 3} \left(7x^3 + 4x^2 + 3x\right)$.

8. Solve $\dfrac{dy}{dx} = Sec \, (x + y)$.

9. Find the Laplace transform of $\{cos \; at \; \}$.

10. If $u = xy - y^3 - 4$, find $\dfrac{\partial u}{\partial x}$ and $\dfrac{\partial u}{\partial y}$.

PART-B (5x10=50)

11. (a) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$ show that $A^2 - 4A - 5I = 0$.

   (b) Show that $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^3 & b^3 & c^3 \end{vmatrix} = (a - b)(b - c)(c - a)(a + b + c)$ 10M

12. (a) If $SinA = 4/5$ and $SinB = 5/13$ then find the value of $Sin \, (A + B), Cos \, (A + B)$

   (b) Eliminate θ from $x = a \; Sec \; \theta, y = b \; Tan \; \theta$, Prove that $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$ 10M

13. (a) Find the equation of the circle passing through the points (0,2) (3,0) (3,2)
    (b) Find the equation of the parabola whose Focus is (-1, 1) and directix is
       $x + y + 7 = 0$ 10M

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14. (a) If $u = Sin^{-1}\left(\dfrac{x^2 + y\,2}{x + y}\right)$, then $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = Tan\ u$.

(b) Find $\dfrac{dy}{dx}$ if $y = \dfrac{\log\ x}{1 + \log\ x}$.   10M

15. (a) Evaluate $\int_0^4 \dfrac{1}{\sqrt{16 - x^2}}\ dx$.

(b) Evaluate $\int x^2\ Sin\ 3x\ dx$.   10M

16. (a) Solve $(e^x + 1)\,y\,dy = (y + 1)\,e^x\,dx$.

(b) Solve $\dfrac{dy}{dx} = \dfrac{x^2 + y^2}{xy}$.   10M

17. (a) Find the Laplace transforms of $e^{2t}\left(2t^2 - 3t + 4\right)$.
(b) Find the Laplace transforms of $\cos\ 3t.\ Sin\ 2t$.   10M

18. (a) Find the equation of the circle whose centre is (-2, 3) and passing through the centre of the circle $x^2 + y^2 - 6x + 4y + 9 = 0$.

(b) Show that $\displaystyle\lim_{x \to 2} \dfrac{Tan\ (x - 2)}{x^2 - 4} = \dfrac{1}{4}$.   10M

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