Roll No. | | | | | | | | | | | | |

Total No. of Pages : 03

Total No. of Questions : 18

Pharm. D (PCB Students) (Sem.–1)

REMEDIAL MATHEMATICS

Subject Code : 1.6

M.Code : 26513

Time : 3 Hrs. **Max. Marks : 70**

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A contain SEVEN questions. Attempt any FIVE questions. Each question will carry TWO marks each.
2. SECTION-B contain EIGHT questions (Short Essay Type). Attempt any SIX questions. Each question will carry FIVE marks.
3. SECTION-C contain THREE questions (Long Essay Type). Attempt any TWO questions. Each question will carry FIFTEEN marks.

SECTION-A

1. Find the eigen value and eigen vector of $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$.

2. If $\Delta_1 = \begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix}$ and $\Delta_2 = \begin{vmatrix} 1 & bc & a \\ 1 & ca & b \\ 1 & ab & c \end{vmatrix}$ then

   A. $\Delta_1 + \Delta_2 = 0$

   B. $\Delta_1 + 2\,\Delta_2 = 0$

   C. $\Delta_1 = \Delta_2$

   D. None of these

3. If A is a singular matrix then adj A is :

   A. Non singular

B. Singular

C. Symmetric

D. Not defined

4. $\lim_{x \to 0} \frac{1-\cos 2x}{x}$ is equal to :

A. 0

B. 1

C. 4

D. 2

5. Find Laplace transform of sin $2t$ sin $3t$?

6. State Leibnitz's theorem.

7. State Euler's theorem for homogeneous functions of two variable.

SECTION-B

8. Using Cayley Hamilton theorem, find the inverse of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

9. Determine the rank of $\begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$.

10. Calculate the area of a triangle whose vertices are A (1, 0, –1), B (2, 1, 5) and C(0, 1, 2).

11. Differentiate with respect to x

$$x \sin x \, log \, x$$

12. Differentiate with respect to x.

$$x^{\sin x} \text{ [using logarithmic differentiation]}$$

13. Evaluate $\int \left(x^2 + \frac{1}{x^2} \right)^3 dx$.

14. Evaluate $\int \frac{2x-1}{(x+1)(x^2+2)} dx$ using partial fractions.

15. If $y = e^{ax} \sin bx$, prove that $y_2 - 2ay_1 + (a^2 + b^2)\, y = 0$ using successive differentiation.

SECTION-C

16. Find Laplace transformation of $te^{-t} \cos(2t)$.

17. a) If $\frac{x^2}{a^2+u} + \frac{y^2}{b^2+u} + \frac{z^2}{c^2+u} = 1$, prove that :

$$\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial u}{\partial y}\right)^2 + \left(\frac{\partial u}{\partial z}\right)^2 = 2\left(x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z} \right)$$

b) Evaluate $\int \frac{(x^2+8x+4)}{x^3-4x} dx$.

18. a) Solve the differential equation :

$$(1 + x)(1 + y^2)\, dx + (1 + y)(1 + x^2)\, dy = 0$$

b) Solve $x\frac{dy}{dx} + y = y^2 x^3 \cos x$.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.