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 $\begin{matrix} 5 & 4 \\ 1 & 2 \end{matrix}$.

2. If $_1 \begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a2 & b2 & c2 \end{vmatrix}$ and $_2 \begin{vmatrix} 1 & bc & b \\ 1 & ca & c \\ 1 & ab & a \end{vmatrix}$ then

   A. $_1 + _2 = 0$

   B. $_1 + 2 \ _2 = 0$

   C. $_1 = _2$

   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 Find Laplace transform of sin 2t sin 3t? State Leibnitz's theorem. State Euler's theorem for homogeneous functions of two variable.

5.

6.

7.

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.

xsin x [using logarithmic differentiation]

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

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 :

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

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.