

PARUL UNIVERSITY
FACULTY OF PHARMACY
Pharm.D November-2019 Examination

Year: 1
Subject Code: 08207131
Subject Name: Remedial Mathematics

Date: 24/12/2019
Time: 10:00 am to 1:00 pm
Total Marks: 70

Instructions

1. Figures to the right indicate maximum marks.
2. Make suitable assumptions wherever necessary.

Q.1 Essay Type Questions. (any 2 out of 3) (15 Mark Each) (30)

1. (a) Solve the given system by using crammer's rule (05)

$$\begin{aligned}x + y + z &= 3 \\2x + y + 3z &= 6 \\x + 2y + 2z &= 5\end{aligned}$$

- (b) Find the equation of a line passing through (2,4) and parallel to $3x + 5y + 7 = 0$ (05)

2. (a) Find the inverse of the given matrix $\begin{bmatrix} -2 & -8 & -12 \\ 1 & 4 & 4 \\ 0 & 2 & 1 \end{bmatrix}$ (05)

- (b) If $y = 2e^{3x} + 3e^{-2x}$ then prove that $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 6y = 0$ (05)

3. (a) Evaluate $\int x \cos x \, dx$ (05)

- (b) Solve $x^2 dy - y^2 dx = 0$ (05)

Q.2 Short Essay Type Questions. (any 4 out of 5) (5 Mark Each) (20)

1. If the distance between (5,7) and (-3,m) is 10, then find the value of m.

2. Evaluate $L(e^{-t} \sin 2t)$

3. In a ΔABC , $a=3$, $b=3$, $c=4$. Then find the value of r , R and Δ

4. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$ then find AB and BA . Also check $AB = BA$?

5. Write the division rule of differentiation and hence find $\frac{d}{dx} \left(\frac{1+\sin x}{1-\sin x} \right)$

Q.3 Short Answers. (2 Mark Each) (20)

1. Find the order and degree of the given differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + \sin x = 0$

2. If $A = \begin{bmatrix} 1 & -1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ -3 & 4 \end{bmatrix}$ then prove that $(A + B)^T = A^T + B^T$

3. Evaluate $\int_1^2 x^2 \, dx$

4. Find the center and radius of the circle $x^2 + y^2 - 2x + 4y + 9 = 0$

5. Find $\frac{d}{dx} (\log x e^x)$

6. Prove that the given points (-1,4), (2,3), (8,1) are collinear.

7. Find the x-intercept, y-intercept and slope of $2x - 3y + 6 = 0$

8. If $z = x^2y + xy^2$ then find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ at (1,2)

9. If $\begin{vmatrix} x-2 & 3 \\ 4 & x+2 \end{vmatrix} = 0$ then find the value of x

10. Find the value of $\sin^2 30^\circ + \cos^2 60^\circ + \tan^2 45^\circ$