

PARUL UNIVERSITY
FACULTY OF PHARMACY
B.Pharm., Summer 2017-18 Examination

Semester: 1
Subject Code: 08101105
Subject Name: Elementary Remedial Mathematics

Date: 07/06/2018
Time: 02:00 pm to 05:00 pm
Total Marks: 75

Instructions:

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

Q.1 Essay type Questions. (Any 2 out of 3) (10 marks each)

1. (A) Explain the pharmaceutical application of determinant (7)
 (B) Solve the following system of linear equations using Cramer's rule. (3)
 $x + 2y = 9, 2x - 3y = 4$
2. (A) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ then prove that $A^2 - 5A + 7I = 0$, Where I is 2×2 identity matrix (7)
 (B) Prove that $\sin x \cdot \cot x = \cos x$ (3)
3. (A) Find inverse of matrix $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ (7)
 (B) Differentiate $y = x^x$ with respect to x . (3)

Q.2 Short Essay type Questions. (Any 7 out of 9) (5 marks each)

1. Find the equation of line whose slope is $-1/2$ and passing through the point which is intersection of lines $x + y = 5$ and $2x + y = 7$. (35)
2. The number N of bacteria in a culture grew at the rate proportional to N . The value of N was initially 100 and increased to 332 in one hour. what will be the value of N after 1.5 hours?
3. Solve: $\tan^{-1} \frac{1}{8} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{2}$
4. Evaluate: $\int x^2 \log x \, dx$
5. Find centre and radius of circle $36x^2 + 36y^2 - 12x + 24y - 36 = 0$
6. Simplify: $\frac{\sin 3x + \sin 5x}{\cos 3x + \cos 5x}$
7. solve: $\frac{dy}{dx} - \frac{1}{x}y = 2x^2$
8. Evaluate: $\lim_{x \rightarrow -2} \frac{x^3 + 6x^2 + 11x + 6}{5x^2 + 10x}$
9. Differentiate $y = \frac{4\cos x}{e^x}$ with respect to x .

Q.3 Answer in short. (2 marks each)

1. If $x = \sin(2t + 1)$ then find dx/dt .
2. Define i) symmetric matrix ii) skew symmetric matrix
3. Find Distance between $A(2, 3)$ and $B(-2, -3)$.
4. Integrate $\{(1/x) - \cos x\}$ with respect to x .
5. Angle between $x + y = 0$ and $x - y = 0$ is _____
6. If $A = \begin{bmatrix} 1 & -2 \\ 3 & -3 \end{bmatrix}$ then $\text{adj}(A) =$ _____
7. $\tan^{-1}(\infty) + \cos^{-1}\left(\frac{1}{2}\right) =$ _____
8. $\int_{-3}^3 x^7 \, dx =$ _____
9. Find equation of circle having centre $(2, 3)$ with radius 4.
10. $\lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3} =$ _____