Roll No. | | | | | | | | | | | | | **Total No. of Pages : 03**

Total No. of Questions : 10

B.Pharma (Sem.–3)

PHARMACEUTICAL MATHEMATICS

Subject Code : BPHM-301

M.Code : 46221

Date of Examination : 12-12-22

Time : 3 Hrs. **Max. Marks : 80**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of FIFTEEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.**
3. **SECTION-C contains FOUR questions carrying TEN marks each and students have to attempt ANY THREE questions.**

SECTION-A

1. Solve the following :

a) Find | A |, where A = $\begin{pmatrix} 1 & -1 \\ -2 & 2 \end{pmatrix}$.

b) Solve the system of equations : $x + 2y = 3$; $5x - y = 4$

c) Find the value of tan 315º.

d) Find 1 radian angle in degrees, minutes, seconds.

e) Evaluate $\lim_{x \to 0} \frac{3^x - 2^x}{\sqrt{x}}$.

f) If $x^2 + xy + y^3 = 3$, then find $\frac{dy}{dx}$.

g) Evaluate $\int xe^{x^2} dx$.

h) Expand $\frac{1}{x^2 - 2x + 1}$ using partial fraction.

i) Find the value of x, if the mode of the following data is 25 :

15, 20, 25, 18, 14, 15, 25, 18, 16, 20, 25, 20, x, 18.

j) Calculate the standard deviation of the values : 5, 10, 24, 30, 50.

k) A garden contains 39 plants. Some plants were chosen at random, and their heights were recorded in cm : 38, 51, 46, 79 and 57. Calculate their height's variance.

l) Find the mean of binomial distribution if $n = 6$ and $q = 1/6$.

m) Give two real life examples where Poisson distribution is applicable.

n) Find the value of a such that $\begin{pmatrix} 1 & a \\ 2-a & 3 \end{pmatrix} = \begin{pmatrix} 1 & -1 \\ 3 & 3 \end{pmatrix}$.

o) If $A = \begin{pmatrix} 3 & 2 \\ 1 & 3 \end{pmatrix}$, then find $|A^{-1}|$

SECTION-B

2. Find the real value of x such that $\begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix} = 8$.

3. Find the inverse of the matrix $\begin{pmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{pmatrix}$.

4. Find the 2nd successive derivative of $f(x) = e^{3x} \cos x \sin^2 x$.

5. Evaluate $\int 5x^4 \sqrt{x^5 + 1}\, dx$.

6. State five properties of normal distribution.

SECTION-C

7. Solve the system of equations : $x - y + 3z = 3$; $2x + 3y + z = 2$; $3x + 2y + 4z = 5$ using Cramer's rule.

8. Differentiate $(2x - e^{8x})^{\sin(2x)}$ with respect to x.

9. a) Evaluate $\lim_{x \to 0} \frac{\sqrt{x^2 + 9} - 3}{x^2}$.

   b) Evaluate $\int x \log x \, dx$.

10. If A + B + C = π, prove that tan A + tan B + tan C = tan A tan B tan C.

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.