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Total No. of Pages : 03

Total No. of Questions : 10

**B.Pharma (2011 to 2016) (Sem.-3)**  
**PHARMACEUTICAL MATHEMATICS**  
Subject Code : BPHM-301  
M.Code : 46221

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) If a matrix has 8 elements, what are the possible orders it can have?

b) If  $A = \begin{bmatrix} 1 & 0 \\ 3 & 4 \end{bmatrix}$  find the value of  $2A^2 + 3I$ , where I is a unit matrix of order 2.

c) Find the value of determinant  $\begin{vmatrix} 1 & 0 & 2 \\ 2 & 1 & 1 \\ 0 & 4 & 2 \end{vmatrix}$ .

d) If A is a square matrix of order 3 and  $|A| = 3$  find the determinant value of 2A.

e) Find  $\frac{dy}{dx}$  where  $y = x^2 \cos 3x$ .

f) Find the value of limit  $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2}$ .

g) Evaluate the integral :  $\int \frac{dx}{(2x+5)^3}$ .

h) Evaluate the integral  $\int \sin 2x \sin 3x dx$ .

- i) Find the median of 5, 4, 1, 7, 3, 10, 15.
- j) Find the value of  $x$  if mean of 3, 4,  $x$ , 5, 1 is 4.
- k) Variance of a data containing 10 entries is 36, find its standard deviation.
- l) Write the formula for coefficient of variation.
- m) Define Binomial distribution.
- n) Find the value of  $\cos 75^\circ$
- o) Express  $2 \cos 4x \sin 2x$  as an algebraic sum of sines or cosines.

### SECTION-B

- 2. Find the inverse of matrix  $A = \begin{bmatrix} 2 & 1 \\ 3 & 3 \end{bmatrix}$ .
- 3. Differentiate  $x^{\sin x}$  with respect to  $x$ .
- 4. Evaluate  $\int x^2 \log x dx$ .
- 5. Prove that  $\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} = \tan \left( \frac{\theta}{2} \right)$ .
- 6. Find the median of the following distribution :  

<b>Class interval</b>	0-10	10-20	20-30	30-40	40-50
<b>Frequency</b>	5	7	10	8	5

### SECTION-C

- 7. Solve the following by Cramer's rule :  
$$6x + y - 3z = 5$$
$$x + 3y - 2z = 5$$
$$2x + y + 4z = 8$$

8. a) Find  $\frac{dy}{dx}$  if  $x = 1 + \sin t, y = t^2 + 1$

b) Evaluate the integral  $\int \frac{dx}{(x+2)(x-3)}$

9. Calculate the standard deviation of the following data :

X :    4        8        11       17       20       24       32

F :    3        5        9        5        4        3        1

10. a) Draw normal distribution curve and state any three properties of the curve.

b) Prove that  $\cos 20^\circ \cos 40^\circ \cos 80^\circ = \frac{1}{8}$

**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.**