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Total No. of Pages : 03

Total No. of Questions : 10

B.Pharmacy (Sem.-3)

PHARMACEUTICAL MATHEMATICS

Subject Code : (PHM-233)

M.Code : [46125]

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. Answer the following :

a) Evaluate the determinant $\begin{vmatrix} 102 & 18 & 36 \\ 1 & 3 & 4 \\ 17 & 3 & 6 \end{vmatrix}$

b) Find the adjoint of a matrix of order 2 whose elements are given by $a_{ij} = 3i + j$

c) For any two square matrices A and B, Is $AB = BA$? Justify your answer.

d) Find the value of $\tan 75^\circ$.

e) Evaluate the limit $\lim_{x \rightarrow 0} (x^2 + \sin x + 5)$

f) Show that $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A$.

g) Find the derivative of the function $f(x) = e^{x^2} \sin x$ w.r.t. x .

h) If $\log(xy) = \cos x$, find $\frac{dy}{dx}$.

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



- j) Solve the integral $\int \frac{\cos \sqrt{x}}{\sqrt{x}} dx$.
- k) Find the mean and variance for first n natural numbers.
- l) Define Binomial distribution.
- m) What are the measures of dispersion?
- n) Six coins are tossed 6400 times. Using the Poisson distribution, find the approximate probability of getting six heads r times.
- o) If X is a normal variate with mean 30 and S.D. 5. Find $P(26 \leq X \leq 40)$.

SECTION-B

2. Prove that $\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$.
3. Differentiate $\sqrt{\frac{(x-3)(x^2+4)}{3x^2+4x+5}}$ with respect to x .
4. Solve the integral $\int \frac{xe^x}{(1+x)^2} dx$.
5. Find the inverse of the matrix $\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$.
6. Calculate mean, variance and standard deviation of the following frequency distribution :

Classes :	1-10	10-20	20-30	30-40	40-50	50-60
Frequency :	11	29	18	4	5	3

SECTION-C

7. Prove that
$$\begin{vmatrix} a^2 & bc & ac+c^2 \\ a^2+ab & b^2 & ac \\ ab & b^2+bc & c^2 \end{vmatrix} = 4a^2b^2c^2.$$

8. a) A set of 8 symmetrical coins was tossed 256 times and the frequencies of throws observed were as follows :

No. of heads	0	1	2	3	4	5	6	7	8
Frequency of throws	2	6	24	63	64	50	36	10	1

Fit a binomial distribution to above data :

- b) Write properties of Normal distribution curve.
9. a) If $y = x^{\sin x} + (\sin x)^x = 7$, then find $\frac{dy}{dx}$.
- b) Show that $\sqrt{3} \operatorname{cosec} 20^\circ - \sec 20^\circ = 4$.
10. a) Solve the integral $\int \frac{x}{(x-1)(x-2)(x-3)} dx$.
- b) Find the values of a and b , so that the function defined by

$$f(x) = \begin{cases} 5 & x \leq 2, \\ ax+b & 2 < x < 10 \\ 21 & x \geq 10 \end{cases}$$

is a continuous function.

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.