Printed Pages : 2 **Roll No.** | | | | | | | | | | | **RPH210**

B.PHARM.

THEORY EXAMINATION (SEM–II) 2016-17

PHARMACEUTICAL MATHEMATICS AND BIOSTATISTICS

Time : 3 Hours ***Max. Marks : 70***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION A

1. Attempt all parts of this question. Each part carries two marks (7×2=14)

(a) Find $\begin{vmatrix} 2 & 4 \\ 1 & 3 \end{vmatrix}$.

(b) Evaluate $\int (x^3 + 4)\, dx$.

(c) Two coins are tossed together. Write the sample space of the experiment.

(d) The mean of a binomial distribution is 20 and standard deviation is 4. Calculate n, p and q with usual notations.

(e) Find $\lim_{x \to 2} x^2 + 2x + 2$.

(f) Find $\frac{dy}{dx}$, if $y = x^2 + \cos x$.

(g) Find the mean of 5, 6, 8, 10, 15, 20, 25 .

SECTION B

2. Attempt any Three parts of this question. $(3 \times 7 = 21)$

(a) Calculate the arithmetic mean of the given data by (i) Direct method and (ii) Shortcut method

Class	20-30	30-40	40-50	50-60	60-70
Frequency	8	26	30	20	16

(b) If $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$, then find A^{-1}.

(c) Find the median from the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	2	18	30	45	35	20	6	3

(d) From the following data obtains the two regression equations.

X	6	2	10	4	8
Y	9	11	5	8	7

(e) There are 5% defective items in a large bulk of items. What is the probability that a sample of 10 will include not more than one defective item?

SECTION C

3. Attempt any two parts of the following: $(3\frac{1}{2} \times 2 = 7)$

(a) Solve the system of equations 2x + 5y = 1 and 3x + 2y = 7.

(b) Show that the matrix A = $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ satisfies the equation $A^2 - 4A + I = O$, where I is 2x2 identity matrix and O is 2x2 zero matrix.

(c) Find values of x for which $\begin{vmatrix} 3 & x \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$.

4. Attempt any two parts of the following: $(3\frac{1}{2} \times 2 = 7)$

(a) If y = cosx + sin2x, the find dy/dx.

(b) Evaluate $\int xe^x dx$.

(c) Find $\lim_{x\to 0} \frac{e^x - 1}{x}$.

5. Attempt any two parts of the following: $(3\frac{1}{2} \times 2 = 7)$

(a) Find mode for the following data:

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
Frequency	29	195	241	117	52	10	6	3	2

(b) Find the standard deviation from the following data:

Marks	8	9	10	11	12	13	14
Frequency	2	4	6	9	6	4	2

(c) Find median of the data: 3, 5, 7, 9, 11, 13,15, 17, 19, 21.

6. Attempt any two parts of the following: $(3\frac{1}{2} \times 2 = 7)$

(a) Calculate the Karl Pearson coefficient of correlation from the data given below:

X	5	9	13	17	21
Y	12	20	25	33	35

(b) Find regression coefficients, given that: n = 7, $\sum x = 24$, $\sum y = 12$, $\sum x^2 = 374$, $\sum y^2 = 97$ and $\sum xy = 157$.

(c) The I.Q and economic condition(E.C.) of home of 1000 students of an engineering college, were noted as given in the table:

E.C. \ I.Q.	High	Low
Rich	100	300
Poor	350	250

Find out whether there is any association between economic condition and I. Q. of the students. Given: χ^2 at the level of significance 0.05 = 3.84

7. Attempt any two parts of the following: $(3\frac{1}{2} \times 2 = 7)$

(a) If P(A) = $\frac{7}{13}$, P(B) = $\frac{9}{13}$ and P(A∩B) = $\frac{4}{13}$, evaluate P(A|B) and P(B|A).

(b) Assume mean height of solders to be 68.22 inches with a variance of 10.8 inces square. How many soldiers in a regiment of 1,000? Would you expect to be over 6 feet tall, given that the area under the standard normal were between z = 0 and z = 0.35 is 0.1368 and between z = 0 and z = 1.15 is 0.3746.

(c) A coin is tossed successively three times. Find the probability of getting exactly one head or exactly two heads.