



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 150205**

Roll No.

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## B. Pharm.

(SEM. II) THEORY EXAMINATION, 2014-15  
**PHARMACEUTICAL MATHEMATICS & BIostatISTICS**

Time : 3 Hours]

[Total Marks : 70

### PART - A

1 Attempt all parts : Each parts carries 2 marks :  $7 \times 2 = 14$

(a) If  $y = e^{x^2+2x}$  then find  $\frac{dy}{dx}$ .

(b) Evaluate  $\int \frac{\sec^2(\log x)}{x} dx$

(c) Solve :  $(D^2 - 5D + 6)y = 0$

(d) Write Empirical formula ie relation between mean, median and mode.

(e) Write recurrence formula for binomial distribution.

(f) What is the probability of drawing white ball from a bag containing 5 white and 6 red balls.

(g) Write mean and S.D. of Poisson distribution.

**PART - B**

**2** Attempt any six parts of the following : **6×4=24**

(a) Prove that  $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \log_e a$

(b) If  $y = \sqrt{\tan x + \sqrt{\tan x + \sqrt{\tan x + \dots \infty}}}$  then

prove that  $\frac{dy}{dx} = \frac{\sec^2 x}{2y-1}$

(c) Solve :  $(D^2 + 7D + 12)y = e^{2x}$

(d) Draw a Histogram of the following data :

C.I.	0-10	10-20	20-30	30-40	40-50
Frequency	5	15	20	10	10

(e) Find out the mode from the given data

Class	0-10	10-20	20-30	30-40	40-50	50-60
Integral						
Frequency	5	15	40	32	28	5

(f) Calculate Spearman rank correlation coefficient from following data :

$R_1$ (Rank of $x$ )	5	2	1	6	7	4	3	8
$R_2$ (Rank of $y$ )	5	4	1	6	7	3	2	8

(g) Find the regression line for the following data

$$\Sigma x = 30, \quad \Sigma x^2 = 190, \quad \Sigma xy = 192, \quad \Sigma y = 30,$$

$$\Sigma y^2 = 190, \quad n = 5.$$

(h) For a Binomial distribution If mean and standard deviation is 20 and 4 then find value of  $n$ ,  $p$  and  $q$ .

### PART - C

3 Attempt any four parts of the following : **4×8=32**

(a) If  $\sin y = x \sin(a + y)$  then prove that

$$\frac{dy}{dx} = \frac{\sin^2(a + y)}{\sin a}$$

(b) Evaluate :  $\int \frac{x^2 + 1}{x^4 + 1} dx$

(c) Solve :  $(D^2 - 5D + 6)y = \sin 3x$

(d) Calculate coefficient of variation (C.V.) for the following distribution

Class Interval	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	8	12	12	18	14	10

- (e) The following figure related to the cost of construction of a house in Lucknow.

Items	Bricks	Steel	Cement	Timber	Labour	Misce-llaneous
Expen-diture	20%	18%	10%	15%	25%	12%

Draw a pie diagram of the above data.

- (f) A sample of 200 persons with a particular disease was selected. Out of these 100 were given a drug and other were not given any drug. The results were as given below :

	Drug	No Drug	Total
Cured	65	55	120
Not Cured	35	45	80
Total	100	100	200

Test whether the drug is effective or not. Given that For 1 degree of freedom at 5% level of significance  $\chi^2 = 3.84$ )

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