



**DPP-4623**

**B. Com. LL. B. (Hons.) (Sem. II) (Five Years  
Integrated Course) Examination  
March / April - 2016  
Mathematics & Statistics : Paper - II**

Time : 3 Hours]

[Total Marks : 70

**Instructions :**

(1)

नीचे दशावेक निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
← B. COM. LL. B. (HONS.) (SEM. 2) (FIVE YE. INTE. COU.)	<input type="text"/>
Name of the Subject :	<input type="text"/>
← MATHEMATICS & STATISTICS : PAPER - 2	<input type="text"/>
← Subject Code No. : <input type="text" value="4"/> <input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="3"/>	<input type="text"/>
← Section No. (1, 2,.....) : Nil	
	Student's Signature

- (2) Figures to the right indicate marks of the respective questions.  
(3) Statistical tables and simple calculator can be used.

1 Answer the following questions :

- (i) In a correlation analysis, the value of the Karl Pearson's coefficient of correlation and its probable error were found to be 0.90 and 0.04 respectively. Find the value of pairs of observations. 2
- (ii) If correlation coefficient is 0.8, variance of x is 9 and regression line of y on x is  $y = 3.2x + 58$  then find standard deviation of y. 1
- (iii) Write the probability function of a binomial distribution whose mean is 9 and standard deviation is  $\frac{3}{2}$ . 2
- (iv) If parameter of Poisson distribution is 4 then find standard deviation. 1
- (v) What is the meaning of forecasting ? 2

- (vi) In a working class budget inquiry in towns A and B, it was found that an average working class family's expenditure on food and other items was as follows : 2

	Town A	Town B
Food	50%	64%
Other Items	50%	36%

In 2004 the working class cost of living index was 265 for town A and 279 for town B. It was known that rise in prices for articles consumed by working class was same for both the towns. What was year 2004 index for food and other items ?

- 2 (a) Explain Bernoulli trials. Write the properties of binomial distribution. 5
- (b) The result of an examination is given below. 10% candidates passed with distinction. 60% without distinction and 30% were failed. It is known that a candidate fails if he obtains less than 40 marks out of 100, while he must obtain at least 75 marks in order to pass with distinction. Determine the mean and standard deviation of the distribution of marks assuming distribution to be normal. 5
- (c) For a Poisson variable  $x$  if  $P(x=0) = 0.05$  then find  $P(x > 2)$ . 5

**OR**

- 2 (a) Write the probability functions of normal and standard normal variables. State the importance of normal distribution. 5
- (b) Fit a Poisson distribution to the following data : 5

Number of accidents	0	1	2	3	4 or more
Number of days	74	72	38	12	4

$$(e^{-1} = 0.368)$$

- (c) The overall percentage of failure in a certain examination is 40. What is the probability that out of a group of 6 students (i) at least 4 passed (ii) no one failed in the examination ? 5

- 3 (a) What is the meaning of correlation ? Explain scattered diagram method to study correlation. 5
- (b) Calculate the correlation coefficient for the following data : 5

Class for X	Class for Y				
	0-500	500-1000	1000-1500	1500-2000	2000-2500
0 - 200	12	6	-	-	-
200-400	2	18	4	2	1
400-600	-	4	7	3	-
600-800	-	1	-	2	1
800-1000	-	-	1	2	3

- (c) Given the following results for the height (x) and weight (y) in appropriate units of 1000 students. 5
- $\bar{x} = 68$ ,  $\bar{y} = 150$ ,  $\sigma_x = 2.5$ ,  $\sigma_y = 20$  and correlation coefficient between x and y is 0.60. Obtain two lines of regression. Estimate the height of student A whose weight is 200 units and also estimate the weight of student B whose height is 60 units.

OR

- 3 (a) Why there are two regression lines ? State the importance of study of regression. 5
- (b) The equation of two regression lines between two variables are  $2x - 3y = 0$  and  $4y - 5x - 8 = 0$ . Find  $\bar{x}$ ,  $\bar{y}$  and correlation coefficient. 5
- (c) Find the rank correlation coefficient between sales and expenses of the firms ('000 Rs.) 5

Firm	1	2	3	4	5	6	7	8	9	10
Sales	50	56	54	60	67	63	60	62	68	69
Expenses	21	23	24	27	32	34	28	30	33	32

- 4 (a) State various methods of forecasting. Discuss any one of them. 7
- (b) State general assumptions of forecasting. Also state limitations of forecasting. 8

OR

- 4 (a) Discuss the importance of forecasting. 7  
 (b) Fit a trend line to the following data giving the 8  
 milk production of Co-operative Society. Also find the  
 expected production for the year 2005 and 2006 :

Year	1999	2000	2001	2002	2003	2004
Milk Production (100 litres)	20	25	27	35	38	41

- 5 (a) What is index number ? Discuss the utility of index 5  
 number.  
 (b) Using the following data show that Fisher's index 5  
 number satisfy time reversal and factor reversal tests :

Commodity		A	B	C	D	E
Price (Rs.)	Base Year	6	2	4	10	8
	Current Year	10	2	6	12	12
Number of units used	Base Year	50	100	60	30	40
	Current Year	56	120	60	24	36

- (c) Explain the method of constructing cost of living 5  
 index number.

**OR**

- 5 (a) Which are the main points to be considered in the 5  
 construction of index number ?  
 (b) Construct Marshal Edjworth's and Dorbish Bowley's 5  
 index numbers from the following data :

Commodity		A	B	C	D
2006	Price (Rs.)	2	5	4	2
	Quantity	8	10	14	9
2007	Price (Rs.)	4	6	5	2
	Quantity	6	5	10	3

- (c) An index number is 100 in the year 2005. It rises 4% 5  
 in 2006, falls 6% in 2007, falls 4% in 2008 and rises  
 3% in 2009. Calculate the index number for five years  
 with 2007 as base year.