Seat No. : _____

AA-117

April-2016

S.Y.MBA Integrated

Business Statistics

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (1) Non-programmable scientific calculator can be used.
(2) Statistical table will be provided on request.

1. Attempt any **two** : **20**

(1) A manufacturer, who produces medicine bottles, find that 0.1% of the bottles are defective. Bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Using Poisson distribution find how many boxes will contain

(i) No defective

(ii) At least 2 defective

(iii) More than 4 are defective

(2) Fit a Binomial distribution to the following data :

x :	0	1	2	3	4	5	6	7
f :	7	6	19	35	30	23	7	1

(3) Catalog age lists the top 17 U.S. firms in annual catalog sales. Dell computer is number one, followed by IBM and W.W. Grainger. Of the 17 firms on the list, 8 are in some type of computer related business. Suppose 5 firms are randomly selected.

(a) What is the probability that none of the firms is in some type of computer-related business ?

(b) What is the probability that all five firms are in some type of computer related business ?

(c) What is the probability that exactly three are in non-computer relate business ?

2. Attempt any **two** : **20**

(1) Define probability density function of uniform distribution. Also state its properties and uses.

(2) A project yields an average cash flow of ₹ 500 lakhs with a standard deviation of ₹ 80 lakhs. Calculate the following probabilities assuming the Normal distribution.

(i) Cash flow will be more than ₹ 550 lakhs

(ii) Cash flow will be less than ₹ 440 lakhs

(iii) Cash flow will be between ₹ 450 lakhs and ₹ 530 lakhs

(3) During the dry month of August, one U.S. city has measurable rain on average only three days per month. If the arrival of rainy days in Poisson distributed in this city during the month of August, what is the average number of days that will pass between measurable rain ? What is the standard deviation ? What is the probability during this month that there will be a period of less than two days between rain ?

3. Attempt any **two** : **20**

(1) Define correlation. Explain various types of correlation with suitable example. Also state its application in business.

(2) Calculate the Karl Pearson's coefficient of correlation from the following data. Also comment on result.

x :	43	44	46	40	44	42	45	42	38	40	42	57
y :	29	31	19	18	19	27	27	29	41	30	26	10

(3) 800 candidate of both sex appeared at an examination. The boys out numbered the girls by 15% of the total. The number of candidates who passed exceed the number failed by 480. Equal no of boys and girls failed in the examination. Find out coefficient of association between sex and result.

4. Attempt any **two** : **20**

(1) Price Index number of wheat (x) and cereals (y) at twelve successive seasons are as given below :

x :	87	84	88	102	101	84	72	84	83	98	97	100
y :	88	79	83	97	96	90	82	84	88	100	80	102

(i) Fit a line of regression of y on x.

(ii) Suggest what the value of y will be when x is expected to be 110 ?

(2) The two regression lines are given by

$3x + 2y = 6$ and $7x + 5y = 12$

(i) Identify the lines of Regression

(ii) Estimate y when $x = 10$

(iii) Calculate the value of correlation coefficient between x and y.

(3) Following is the distribution of students according to their height and weight.

Height (inches)	**Weight (in lbs) X**			
	90 – 100	**100 – 110**	**110 – 120**	**120 – 130**
50 – 55	7	4	2	5
55 – 60	10	6	4	7
60 – 65	12	6	7	10
65 – 70	8	3	3	6

(i) Calculate the two coefficient of regression.

(ii) Obtain the two regression equation.

(iii) Estimate weight of student whose height is 53".

(iv) Estimation height of student whose weight is 115 lbs.

5. (a) Attempt any **one** : **10**

(1) Calculate the seasonal Indicies by the method of Link Relatives.

	1983	**1984**	**1985**	**1986**	**1987**
I	45	48	49	52	60
II	54	56	63	65	70
III	72	63	70	75	83
IV	60	56	65	72	86

(2) For the following data verify that the 5 yearly weighted moving average trend values with weights 1, 2, 2, 2, 1 respectively are equivalent to 4 yearly centred moving average trend values.

Year :	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sales :	9	9	8	10	9	8	4	6	7	3	5

(b) What do you mean by time series ? Discuss the various components of a time series. Also state different methods of measurement of the components. **10**

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