CHRIST UNIVERSITY,BENGALURU - 560029

End Semester Examination March - 2017

Bachelor of Computer Applications II SEMESTER

Code: BCA232 **Max.Marks: 100**

Subject: STATISTICS II FOR BCA **Duration: 3Hrs**

SECTION A

Answer any 10 questions **10X2=20**

1 What are the limits of the correlation coefficient 'r'? What do positive, negative and zero values of 'r' indicate?

2 Write the realationship between correlation and regression coeffecients

3 In a bivariate data 4, 8 and 10 are repeated 4, 3 and 6 times respectively. Find the value of the correction factor.

4 Mention the mean and variance of a binomial distribution.

5 Write the conditions under which binomial distribution tends to Poisson distribution.

6 Mention the mean and variance of normal distribution.

7 Explain population and sample with examples.

8 Define standard error.

9 Write the confidence interval for difference between two means when variances are known.

10 Define alternative hypothesis and give an example.

11 Write the test statistic for testing equality of two means when variances are unknown.

12 Write the test statistic for testing independence of attributes.

SECTION B

Answer any 5 questions **5X6=30**

13 Given the lines of regression 8X-10Y+66=0 and 40X -18Y=214 find the means of X and Y and obtain the correlation coefficient between X and Y.

14 It is claimed that 15% of the ducks in a particular region have patent schistome infection. Suppose that seven ducks are selected at random. Find the probabilities that

(i) at least two ducks are infected.

(ii) exactly one is infected

(iii) at most three are infected.

15 The U.S. Department of Transportation maintains statistics for consumer complaints per 100,000 airline passengers. In the first nine months of 2009, consumer complaints were 0.99 per 100,000 passengers. What is the probability that in the next 100,000 passengers, there will be

a. no complaints?

b. at least one complaint?

c. at least two complaints?

16 A manufacturer produces piston rings for an automobile engine. It is known that ring diameter is normally distributed with $\sigma = 0.001$ millimeters. A random sample of 15 rings has a mean diameter of 74.036 millimeters. Construct a 99% two-sided confidence interval on the mean piston ring diameter.

17 An experiment reported in *Popular Science* compared fuel economics for two types of similarly equipped diesel mini-trucks. Let us suppose that 12 Volkswagen and 10 Toyota trucks are used in 90- kilometer per hour steady-spaced tests. If the 12 Volkswagen trucks average 16 kilometers per liter with a standard deviation of 1.0 kilometer per liter and the 10 Toyota trucks average 11 kilometers per liter with a standard deviation of 0.8 kilometer per liter, construct a 90% confidence interval for the difference between the average kilometers per liter of these two minitrucks.

Assume that the distances per liter for each truck model are approximately normally distributed with equal variances.

18 Past experience at the Crowder Travel Agency indicated that 44 percent of those persons who wanted the agency to plan a vacation for them wanted to go to Europe. During the most recent busy season, a sampling of 1,000 plans was selected at random from the files. It was found that 480 persons wanted to go to Europe on vacation. Has there been a significant shift upward in the percentage of persons who want to go to Europe? Test at .05 significance level.

SECTION C

Answer any 5 questions **5X10=50**

19 In an effort to determine whether any correlation exists between the prices of stocks of airlines, an analyst sampled six days of activity of the stock market. Using the following prices of Delta stock and Southwest stock, compute the coefficient of correlation. Stock prices have been rounded off to the nearest tenth for ease of computation.

Delta	46.7	46.9	50.5	51.6	53.4	51.3	55.2
Southwest	15.2	15.3	15.3	15.5	16.5	18.3	20.4

20 The following data relate to the scores obtained by 9 salesmen of a certain company in an intelligence test and their weekly sales in thousand rupees:

Salesmen Intelligence	A	B	C	D	E	F	G	H	I
Test Scores	50	60	50	60	80	50	80	40	70
Weekly sales	30	60	40	50	60	30	70	50	60

a) Obtain the regression equation of sales on intelligence test scores of the salesmen

b) If the intelligence test score of a salesman is 65, what would be his expected weekly sales?

21 Toby's Trucking Company determined that the distance traveled per truck per year is normally distributed, with a mean of 50 thousand miles and a standard deviation of 12 thousand miles.

a. What proportion of trucks can be expected to travel between 34 and 50 thousand miles in a year?

b. What percentage of trucks can be expected to travel either below 30 or above 60 thousand miles in a year?

c. How many miles will be travelled by at least 80% of the trucks?

d. What are your answers to (a) through (c) if the standard deviation is 10 thousand miles?

22 The following data represent the number of days absent per year in a population of 5 employees of a small company: 2 4 5 7 9. Assuming that you sample with replacement, select all possible samples of size 2 and construct the sampling distribution of the mean. Compute the population mean. Also obtain the mean and variance of the sampling distribution of the mean.

23 Some psychologists believe that there is a statistical correlation between smoking and absenteeism. The management of a leather goods factory has under consideration 'stop smoking' incentive plans and would therefore be interested in knowing whether the employees who have stopped smoking have better absenteeism records than they had while they were smoking. 9 such employees are selected and their absenteeism records before and after they had stopped smoking is compared. The data follows.

Employee	A	B	C	D	E	F	G	H	I
Days absent / year	20	30	14	6	42	19	18	12	24

(While smoking)									
Days absent / year (After stopping smoking)	10	20	16	5	40	15	22	10	20

At level of significance 0.05, does the comparison tend to support the theory that the employees have less absenteeism after they stopped smoking ?

24 A market researcher firm wants to determine on the basis of the following information whether there exists a relationship between the size of the tube of toothpaste, which a customer buys, and the number of persons in the customer's household. At significance level $\alpha=0.01$, is there a relationship?

	Number of persons in the customer's household			
Size of the tube	1-2	3-4	5-6	>7
Giant	22	107	76	45
Large	55	23	16	12
small	31	69	37	0