CHRIST UNIVERSITY,BENGALURU - 560029

End Semester Examination March - 2015

Bachelor of Computer Applications II SEMESTER

Code: BCA233 **Max.Marks: 100**

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

SECTION A

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

1 Define regression. Give any two uses of regression.

2 Write the formula for computing Spearman's rank correlation coefficient.

3 In a bivariate data 48 is repeated thrice and 85 is repeated thrice. What is the value of the correction factor?

4 Mention the mean and variance of a binomial distribution.

5 If $\lambda = 3$ find the mean and variance of Poisson distribution.

6 What is V(aX) and V(aX+b) when a and b are constants?

7 Define parameter and give an example.

8 Mention the number of samples that can be drawn with replacement and without replacement.

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

10 Define Hypothesis and their types in statistical significance.

11 Write the test statistics for paired t test.

12 Write the test statistic for testing independence of attributes.

SECTION B

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

13 If the two regression equations are Y-0.8375X-10.94=0 and 1.5Y-1.6413X-8.34=0, find the mean values of X and Y and obtain the correlation coefficient between X and Y.

14 The U.S. Department of Transportation reported that in 2009, Southwest led all domestic airlines in on-time arrivals for domestic flights, with a rate of 0.825. Using the binomial distribution, what is the probability that in the next six flights

a. four flights will be on time?

b. all six flights will be on time?

c. at least four flights will be on time?

15 The average number of annual trips per family to amusement parks in the United States is Poisson distributed, with a mean of 0.6 trips per year. What is the probability of randomly selecting an American family and finding the following?

a. The family did not make a trip to an amusement park last year.

b. The family took exactly one trip to an amusement park last year.

c. The family took two or more trips to amusement parks last year.

16 The wall thickness of 25 glass 2-liter bottles was measured by a quality-control engineer. The sample mean was 4.05 millimeters, and the sample standard deviation was s = 0.08 millimeter. Find a 95% l confidence interval for mean wall thickness. Interpret the interval you have obtained.

17 A survey of 1000 students concluded that 274 students chose a professional baseball team A as his or her favourite team. In 1991, the same survey was conducted involving 760 students. It concluded that 240 of them also chose team A as their favourite. Compute a 95% confidence interval for the difference between the proportions of students favouring team A between the two surveys.

18 Steve cutter sells Big-Blade lawn mowers in his hardware sort and is interested in comparing the reliability of the mowers he sells with the reliability of the Big-Blade mowers sold nationwide. Steve knows that only 15% of all Big-Blade mowers sold nationwide require repairs during the first year of ownership. A sample of 120 of Steve's customers reveals that 22 of them required mower repairs during the first year of ownership. At level of significance 0.05,is there evidence that Big-Blade mowers differ in reliability from those sold nationwide.

SECTION C

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

19 Compute Karl Pearson's coefficient of correlation between per capita National Income and per capita Consumer Expenditure from the data given below:

Years	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Per capita National Income	249	251	248	252	258	269	271	272	280	275
Per capita Consumer Expenditure	237	238	236	240	245	255	254	252	258	251

20 Raw materials used in synthetic fiber are stored in a place that has no humidity control. Measurements of the relative humidity in the storage place and the moisture content of a sample of the raw materials (both in percentages) on 11days yield the following results.

Humidity	46	53	37	34	29	60	44	41	48	33	40
Moisture content	12	14	11	10	8	17	12	10	15	9	13

Fit a least square line from which we can predict the moisture content given the humidity.

21 A set of final examination grades in an introductory statistics course is normally distributed, with a mean of 73 and a standard deviation of 8.

a. What is the probability that a student scored below 91 on this exam?

b. What is the probability that a student scored between 65 and 89?

c. The probability is 5% that a student taking the test scores higher than what grade?

d. If the professor grades on a curve (i.e., gives A's to the top 10% of the class, regardless of the score), are you better off with a grade of 81 on this exam or a grade of 68 on a different exam, where the mean is 62 and the standard deviation is 3? Show your answer statistically and explain.

22 The following data represent the number of days absent per year in a population of 5 employees of a small company: 1 3 6 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 a) Explain the procedure for testing value of a population mean.

b) On a certain day, 74 trains are arriving on time at station A and 83 were late. At station B, 65 were on time and 107 were late. Can we conclude that there is difference in the proportion arriving on time at the two stations at 5% level of significance?

24 Two hundred men selected at random from various levels of management were interviewed regarding their concern about environmental issues.The response of each person was tallied into one of three categories: no concern, some concern, and great concern. The results were:

Level of Management	No concern	Some concern	Great concern
Top management	15	13	12
Middle Management	20	19	21
Supervisor	7	7	6
Group leader	28	21	31

Use the .01 significance level to determine whether there is a relationship between management level and environmental concern.