CHRIST (DEEMED TO BE UNIVERSITY),BENGALURU - 560029

End Semester Examination March - 2018

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 Define regression. Give any two uses of regression.

2 Explain Karl Pearson's correlation coefficient. Interpret 'r' when r=1, r=-1 and r=0.

3 In a bivariate data 56 is repeated twice and 95 is repeated thrice. Identify the value of the correction factor.

4 Define binomial distribution, What are the parameters?

5 In a Poisson distribution if P(X=2)=P(X=3) find the parameter.

6 Give the p d f of normal distribution, mention its parameters.

7 Distinguish between statistic and parameter.

8 Choose the confidence interval for single mean when variance is unknown.

9 Explain the concept of confidence interval.

10 Define Hypothesis and their types in statistical significance.

11 Determine the test statistic for testing single mean when variance is unknown and give the corresponding distribution.

12 Select 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 identify the means of X and Y and obtain the correlation coefficient between X and Y.

14 Assuming that one third of the population are consumers of rice so that the chance of an individual being a consumer is 1/3. Assume that 100 investigators each take 10 individuals each to see whether they are consumers. Estimate the number of investigators you would expect to report that (i) three people or less were consumers, (ii) at least two were consumers and (iii) exactly five were consumers.

15 Suppose that in the inspection of metal produced in continuous rolls the number of imperfections spotted by an inspector during a 10-minute period is a random variable having the Poisson distribution with $\lambda = 1.7$. Identify the probabilities that during a 10-minutes period an inspector will find

(a) no imperfection; (b) two imperfections;

(c) one imperfection; (d) at least three imperfections.

16 A particular brand of diet margarine was analyzed to determine the level of polyunsaturated fatty acid (in percentages). A sample of six packages resulted in the following data: 16.8, 17.2, 17.4, 16.9, 16.5, 17.1. Construct a 99% confidence interval of the mean μ. Interpret the interval.

17 Ten engineering schools in the United States were surveyed. The sample contained 250 electrical engineers, 80 being women; 175 chemical engineers, 40 being women. Compute a 90% confidence interval for the difference between the proportion of women in these two fields of engineering.

18 The quality control division of a factory that manufactures batteries suspects defects in the production of a model of mobile phone battery which results in a lower life for the product. Until now, the time duration in phone conversation for the battery followed a normal distribution with a mean of 300 minutes and a standard deviation of 30. However, in an inspection of the last batch produced before sending it to market, it was found that the average time spent in conversation was

290 minutes in a sample of 60 batteries. Assuming that the time is still normal with the same standard deviation, examine whether the quality control suspicions are true at a significance level of 1%?

SECTION C

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

19 Following data pertains to the infant mortality rate and female adult literacy rate in 10 hypothetical countries around the world. Is there any correlation between literacy and IMR? Use Karl Pearson's correlation coefficient and interpret the result.

Country	A	B	C	D	E	F	G	H	I	J
Female adult literacy rate (%)	89	87	59	48	87	79	36	89	91	87
Infant mortality rate(per 1000)	31	23	28	56	28	70	79	12	18	16

20 A corporation owns several companies. The strategic planner for the corporation believes dollars spent on advertising can to some extent be a predictor of total sales dollars. As an aid in long-term planning, she gathers the following sales and advertising information from several of the companies for 2009 ($ millions).

Advertising	12.5	3.7	21.6	60	37.6	6.1	16.8	41.2
Sales	148	55	338	994	541	89	126	379

Develop the equation of the simple regression line to predict sales from advertising expenditures using these data.

21 In 2008, the per capita consumption of coffee in Sweden was reported to be 8.2 kg, or 18.04 pounds. Assume that the per capita consumption of coffee in Sweden is approximately distributed as a normal random variable, with a mean of 18.04 pounds and a standard deviation of 5 pounds.

a. What is the probability that someone in Sweden consumed more than 10 pounds of coffee in 2008?

b. What is the probability that someone in Sweden consumed between 3 and 5 pounds of coffee in 2008?

c. What is the probability that someone in Sweden consumed less than 5 pounds of coffee in 2008?

d. 99% of the people in Sweden consumed less than how many pounds of coffee?

22 The following data represent the number of days absent per year in a population of 6 employees of a small company: 1 3 6 7 7 12. 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 study determined the number of cavity-free children per 100 children in 12 North American cities BEFORE and AFTER public water fluoridation projects. Data are shown below. Test at 0.05 level whether there is any significant difference in fluoride level before and after the water fluoridation project and interpret the result.

After	49.2	30.0	16.0	47.8	3.4	16.8	10.7	5.7	23.0	17.0	79.0	66.0
Before	18.2	21.9	5.2	20.4	2.8	21.0	11.3	6.1	25.0	13.0	76.0	59.0

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 $\alpha=0.01$, inspect if there is a relationship.

	Number of persons in the customer's household			
Size of the	1-2	3-4	5-6	>7

tube				
Giant	22	107	76	45
Large	55	23	16	12
small	31	69	37	0