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| BCS-040 |

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)
Term-End Examination
December, 2015

BCS-040 : STATISTICAL TECHNIQUES

Time : 2 hours   *Maximum Marks : 50*

Note :

(i)   Attempt both Section A and Section B.

*(ii) Attempt any **four** questions from Section A.*

*(iii) Attempt any **three** questions from Section B.*

SECTION A

1. Write any two merits and demerits of Arithmetic Mean. Given below is the data about the number of seeds in a pod of a certain plant. Find the variance :   *5*

No. of Seeds	1	2	3	4	5	6
Frequency	8	14	7	12	3	1

2. Division A and B in a school have 20 students each. One student is to be selected from each division. What is the probability that Rahul in division A will be selected, if 2 students are selected out of 40 students ? *5*

3. A die is rolled 1200 times with the following results :

No. that comes up :	1	2	3	4	5	6
Frequency :	195	289	202	242	163	109

   Test, if the die is unbiased at 5% level of significance. (Given that $\chi^2_{0.05}(5) = 11.07$) *5*

4. Define simple random sampling. Describe the limitations of simple random sampling. Differentiate SRSWR and SRSWOR methods of simple random sampling. *1+2+2*

5. Cancer is present in 22% of a population and is not present in the remaining 78%. An imperfect clinical test successfully detects the disease and with probability 0·70. Thus, if a person has the disease in the serious form, the probability is 0·70 that the test will be positive and it is 0·30 if the test is negative. Moreover among the unaffected persons, the probability that the test will be positive is 0·05. A person selected at random from the population is given the test and the result is positive. What is the probability that this person has the cancer ? *5*

6. The probability that Meena is on time to catch the bus to her office is 0·8. Find the probability that she is late

(a) exactly twice in a 6-day week, and

(b) at least once in a 6-day week.   5

SECTION B

7. In a partially destroyed laboratory, record of an analysis of correlation of data, only the following results are legible :

Variance of x = 9. Regression equations

(i) $8x - 10y + 66 = 0$

(ii) $40x - 18y - 214 = 0$

What were :

(a)   the means of x and y,

(b)   the coefficient of correlation between x and y,

(c)   the standard deviation of y ?   *10*

8. The following table shows the sample values of 3 independent normal random variables, X_1, X_2 and X_3. Assuming that they have equal variances, test the hypothesis that they have the same mean by using ANOVA (Given $F_{(2, 9)}(0.05) = 4.26$) :   *10*

X_1	:	13	11	16	22
X_2	:	16	08	21	11
X_3	:	15	12	25	10

9. The following table gives, for a sample of married women, the level of education and marriage adjustment score :

		Marriage Adjustment Score		
		Low	High	Very High
	Middle School	25	05	10
Level of Education	High School	50	30	40
	College	120	60	60

Can you conclude from the above, the higher the level of education, the greater is the degree of adjustment in marriage ?

Given $\chi^2(4, 0\cdot05) = 9\cdot488$.　　　　　*10*

10. A population of size 500 is divided into 4 strata. The following table gives the data on size and standard deviation of each stratum :

	Strata			
	I	II	III	IV
Size	100	150	150	100
Standard Deviation	05	08	07	10

A stratified random sample of size 100 is to be drawn from the population. Determine the size of samples from each of these strata for :

(a) Proportional Allocation,

(b) Neyman's optimum allocation.　　　　　*10*