LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Com. DEGREE EXAMINATION – COMMERCE

FIRST SEMESTER – NOVEMBER 2015

CO 1812 - ADVANCED BUSINESS STATISTICS

Date : 03/11/2015   Dept. No.   Max. : 100 Marks
Time : 01:00-04:00

Part-A   **(10 x 2 = 20 marks)**

Answer ALL questions. (Use the enclosed Table:'HealingHabitsSurveyData'toanswer Qs. 1 and, 2)

1. a) Identify an ordinal and a nominal variable.   **(1 mark)**

    b) What is the 'range' for the variable 'C1HealHa'?   **(1mark)**

2. Calculate the mean value for the variable 'P7Sleep' for 'AGE' values BELOW 35 years.

3. What is 'skewness'?

4. Explain 'alternate hypothesis'.

5. What is 'Z' distribution.

6. Identify two benefits of a 'Bar Chart'.

7. Explain 'Poisson Distribution'.

8. Explain '2-tailed tests'?

9. Explain β error.

10. What is the probability of a card drawn from a pack of cards will be either a 'Diamond' or a 'Queen'?

Part-B   **(4 x 10 = 40 marks)**

Answer any FOUR questions.

(Use the enclosed Table: ''Healing Habits Survey Data' to answer Qs. 11 and, 16)

11. Develop an interval variable combining B2Excrcs, B3Nosmok,& B4Homefd, variables. Code and label it, appropriately (2 marks). Calculate its Variance (4 marks). Prepare a frequency table for the variables, 'B1Healif' & 'B2Exercs and interpret. (4 marks)-PLEASE CHECK DATA TABLE AT THE END.

12. A number of STUDENTS in a popular college were selected at random to investigate their eating habits. The patronage for four Indian cuisines, were verified across three Educational categories. The results of the survey are shown below. Test the hypothesis (level of significance of 0.05) that the choice of Food (Cuisine) taken is independent of Educational (Degree) Type.

1

TABLE SHOWING EDUCATIONAL CATEGORY VS. CUISINE TYPE			
TYPE OF CUISINE	**DEGREE TYPE**		
	UG	*PG*	**PG *PLUS***
ANDHRA	73	83	5
TAMILNADU	24	24	64
KERALA	55	7	53
NORTH INDIAN	14	54	94

13. Answer any TWO of the following:

(1) The probability of failure in the Computer practical exams is 40%. If 25 batches of 6 students each take the examination, in how many batches 4 or more students would pass?

(2) A bag contains 2 white and 3 black balls. Four persons J, K, L, and M in the order named each draw one ball and do not replace it. The person to draw a white ball receives Rs 200. Determine their expectations..

(3) What is the probability that a leap year selected at random will contain either 53 Thursdays or 53 Fridays.

14. The average package weight of a restaurant meal (buffet) was 750 gms., with a standard deviation of 200 gms. A random sample of 36 meals were drawn from the restaurant. a) What is the probability that the arithmetic mean of the sample exceeds 600 gms. Interpret the result. b) Find the value of sample arithmetic mean within which the middle 95% of all sample means will fall.

15. Help the Commissioner of the city Police, by using the Sign Test to check for improvement in Speeding Bikes, 'before' & 'after' a new Speed Control Program was announced two weeks back.

Before	25	16	36	27	44	33	28	41	51
After	21	33	25	17	53	23	38	53	36

16. What is the correlation between 'P5EDUC' and 'P6Income'? (CHECK TABLE AT THE END)

17. a) What is the utility of 'reliability' and 'validity' in Statistics? b)Explain 'Control Charts' and 'Six Sigma'.

Part-C (2 x 20 = 40 marks)

Answer any TWO questions.
(Use the enclosed Table: 'Entrepreneur Details' to answer Qs. 21)

18. The details of various levels of Advertising recorded in three zones in Chennai city are given below. Are there significant differences in Zonal Profits / and Advertisement levels used in the city?

Advertisements Used	Zonal Profits in Chennai		
	Zone I	Zone II	Zone III
Very High	40	56	52
High	44	60	64
Medium	52	64	36
Low	64	40	38

Test appropriate hypotheses using F-test (you can ask for statistical Tables from your invigilators)

19. Calculate seasonal indices by the Ratio to Moving Average method.

Year	I Quarter	II Quarter	III Quarter	IV Quarter
2011	86	80	79	81
2012	83	76	74	79
2013	86	81	81	85
2014	88	77	74	80
2015	78	73	69	76

20. a. On the basis of observations made on 40 papaya trees, the total correlation of the yield of papaya (X1), amount of seeds (X2); and the amount of medicinal parts (X3) are found to be: 1) $r12 = 0.8; r13 = 0.60; r23 = 0.6$. Comment on the partial correlation between yield of papaya fruits, and the quantum of seeds, eliminating the effect of medicinal parts.

   b. zero order, first order, and second order coefficients

   c. Coefficient of Multiple Determination.

21. Using the attached table on 'Entrepreneurship Details':

   1. Prepare an appropriate research methodology for testing the results. Do you suggest any model of relationships? If so, identify at least three research propositions you would consider quite relevant to the study. Identify clearly the Dependent and independent variables in your model. **(8 marks)**

   2. Attempt a regression analysis, using 'HEALTHY HABITS' (C1HealHa) as the Dependent variable, and 'AGE' (P1AGE) as the Independent variable. Report the explained variance, unexplained variance and the R2 value. **(12 marks)**

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Healing Habits Survey Data

Sno	P1Age	P2Gender	P3Relign	P4Reside	P5Educ	P6Income	P7Sleep	B1Healif	B2Exercs	B3Nosmok	B4Homefd	C1HealHa
1	34	2	1	1	4	2	6	5	5	5	5	15
2	32	1	3	3	4	3	6.5	5	5	4	5	14
3	24	1	2	3	3	2	9	5	4	4	5	13
4	33	2	1	3	4	2	7	4	4	5	5	14
5	52	2	1	1	4	3	6	5	3	1	5	9
6	36	2	2	2	4	2	6	5	5	5	5	15
7	56	2	1	2	4	4	8	4	3	5	5	13
8	38	1	1	3	3	2	8	4	4	5	5	14
9	58	1	2	2	3	2	7	3	5	3	4	12
10	62	1	2	2	3	2	6	3	5	1	5	11

Description of Variables:

CODE	VARIABLE LABELS		CODE	VARIABLE LABELS
P1Age	1. Age (in Years)		The following variables are coded '1' (Strongly Disagree to '5' = Strongly Agree)	
P2Gender	2. Gender (1 Male; 2= Female)		B1Healif	I have a healthy lifestyle.
P3Relign	3. Religion (1= Hindu; 2= Xian; 3= Muslim)		B2Exercs	I engage in physical exercise like walks etc at least once a week.
P4Reside	4. Your residence area		B3Nosmok	I am not a smoker.
P5Educ	5. Educational Qualification (Years of College Education))		B4Homefd	I take home food almost every day.
P6Income	6. Monthly income (in '000's of Rupees)		C1HealHa	Healthy Habits [Combined values of variables B1Healif + B2Exercs + B3Nosmok + B4Homefd].
P7Sleep	7. Number of hours of sleep/day			