LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **STATISTICS**

FIFTH SEMESTER – NOVEMBER 2017

ST 5507/ST 5503 - COMPUTATIONAL STATISTICS

Date: 10-11-2017   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

ANSWER **ANY THREE** QUESTIONS:

1 a) Obtain the equation of the normal curve that may be fitted to the following data:

class	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100
frequency	3	21	150	335	326	135	26	4

(18)

Obtain the expected normal frequencies and test the goodness of fit.

b) A firm that runs a string of retail outlets across a city receives complaints from its clients regarding quality and other aspects and maintains a register of complaints. The following are data on the number of complaint sreceived on100 randomly chosen days:

No. of Complaints	0	1	2	3	4
No. Of day	30	25	20	18	7

(15)

Test at 5% level of significance whether the number of complaints per day follows Poisson distribution.

2 a) Two horses A and B were tested according to the time (in seconds) to run a particular distances with the following results:

Horse A	30	32	34	35	36	31	37	38
Horse B	31	33	31	2	28	32	35	

(18)

Test whether the two horses have the same running capacity. Use 5% significance level.

b) Obtain 90% Confidence interval for the mean of the normal population. The data are given below.

10	6	16	17	13	12	8	14
15	9	7	13	22	15	12	14
18	8	21	23	10	17	25	18
12	19	27	34	39	23	11	24

(8)

c) In a sample of 650 men from a large city, 400 are found to be smokers. In another city 500 out of 900 are found to be smokers. Test whether the cities are significantly different with respect to smoking habit.

(7)

3 a) A population with 300 units is divided into three strata. A stratified random sample was drawn and the observed values in the sample are reported below:

Stratum No.	Stratum Size	Sample observations
1	80	21, 25
2	100	32, 35, 40
3	120	40, 48, 50, 52

(15)

Obtain the estimate   and get an estimate of its variance from the sample data.

(18)

b) Construct a sampling distribution of the sample mean for the following population when random sample of size 2 are taken from it (a) with replacement and (b) without replacement. Also find mean and standard error of the distribution in each case.

Population Unit	1	2	3	4
observation	22	24	26	28

4 a) Calculate the 4 yearly moving averages and 5 yearly moving averages of the following data. Obtain trend values and give their graphical representation.

year	Output (in 1000's)	year	Output (in 1000's)
1990	4	1998	8
1991	5	1999	7
1992	6	2000	6
1993	7	2001	8
1994	9	2002	9
1995	6	2003	10
1996	5	2004	7
1997	7	2005	9

(18)

b) Compute index number for the given data using the following methods (i) Laspeyre's method (ii) Passche's method and (iii) Fisher's ideal formula

Items	Base Year		Current Year	
	Prices (Rs)	Expenditure	Prices (Rs)	Expenditure
A	6	360	10	460
B	2	240	4	240
C	4	350	6	360
D	10	240	12	360
E	8	320	12	432

(10)

c) Construct index number by chain base method from the following data of wholesale prices of a certain commodity:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Price	75	50	65	60	72	70	69	75	84	80

(5)

5 a) Use Wilcoxon Signed rank test to see if there is a difference between the number of days until collection of an account receivable before and after a new collection policy. Use the 5% level of significance.

Before	30	28	40	42	34	28	27	25
After	32	29	37	43	37	27	33	30

(20)

b) Test for randomness for the following data based on run test:

15	77	01	65	69	40	58	16	81	00
21	84	22	28	26	46	66	16	36	66
86	17	43	49	85	40	51	40	10	46

(13)

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