M. SC. (I.T.) SEM. – I (C.B.C.S. COURSE) (2015 COURSE) :
SUMMER - 2018
SUBJECT: a) QUANTITATIVE TECHNIQUES

Day: **Wednesday** Time: **02.30 pm to 05.30 pm**
Date: **30/05/2018** **S-2018-1026** Max. Marks: 60

N.B.:

1) Attempt any **FIVE** questions.
2) Figures to the right indicate **FULL** marks.

Q.1 Write short notes on any **THREE** of the following: **(12)**

a) Merits and demerits of median
b) Relationship between mean, median and mode
c) Confidence interval of mean
d) Hypothesis Testing

Q.2 Obtain the Spearman's Rank correlation coefficient between the variable X and Y from the following pairs of observed values. **(12)**

X	50	55	65	50	55	60	50	65	70	75
Y	110	110	115	125	140	115	130	120	115	160

Q.3 Customers arrive at a service station randomly. The arrival and service patterns are as follows. Simulate the system for arrival of ten customers. **(12)**

Inter Arrival Time (min)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Frequency	2	6	10	25	20	14	10	7	4	2

Service Time (min)	0.5	1.0	1.5	2.0	2.5	3.0
Frequency	12	21	36	19	7	5

Use the following random numbers for simulating the system.

For Inter Arrival Time	78	78	06	04	97	71	78	59	05	95
For Service Time	54	26	51	45	46	84	58	58	60	24

Calculate the following:
i) Total elapsed time
ii) Idle time of the service
iii) Average queue length
iv) Average waiting time of customers

P. T. O.

Q.4 **a)** Explain the concept of Mathematical or 'a priori' probability'. **(04)**

b) The result of an investigation by an expert on fire accidents in buildings are as follows: **(08)**

i) Probability that there could have been short circuit = 0.8

ii) Probability that these could have been LPG cylinder Explosion = 0.2

iii) Probability of fire accident given short circuit in 0.3 and probability of fire accident given LPG explosion is 0.95.

Given that there was a fire accident in a building. What is the probability that it was caused by short circuit.

Q.5 **a)** State and explain various components of Time Service. **(04)**

b) From the following data pertaining to the yearly production of tea, calculate the 3 year moving averages and determine the trend values. List the original data and the trend on the graph. **(08)**

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Prod (Tons)	464	515	518	467	502	540	557	571	586	612

Q.6 From the following data find: **(12)**

i) Two regression coefficients

ii) Two repression equations

iii) Coefficient of correlation between the marks in economics and statistics.

iv) Marks in statistics when marks in economics are 35.

Marks in Economics	26	28	35	33	31	38	30	40	34	32
Marks in Statistics	45	46	49	40	36	33	32	30	31	39

Q.7 Calculate arithmetic mean and median from the following frequency distribution. **(12)**

Weight in Kgs	10-13	13-16	16-19	19-22	22-25	25-28	28-31	31-34	34-37	37-40
Frequency	18	25	37	61	85	64	46	28	19	17

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