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## FACULTY OF INFORMATICS

M.C.A. I-Year I Sem. (Main) Examination, 101182

February/March, 2012

Subject : PROBABILITY AND STATISTICS

Time : 3 Hours ]

[ Max. Marks : 80

**Note :** Answer **One** question from each Unit. All questions carry equal marks.

### UNIT - I

1. (a) Distinguish between primary data and secondary data. Explain the methods of collecting the primary data.
- (b) The weekly observation on cost of living index in a certain city for the year 2008-2009 are given below. Prepare less than and more than cumulative frequency distribution.

CLI	140-150	150-160	160-170	170-180	180-190	190-200
No.of weeks	5	10	20	9	6	2

OR

2. (a) What is a two dimensional diagram. Write some of the commonly used two dimensional diagram.
- (b) Represent the following data relating to the military statistics during a war in an year by a multiple bar diagram.

<u>Category</u>	<u>Country 1</u>	<u>Country 2</u>
Army division	4	20
Semi Army units	50	-
Fighter planes	75	700
Tanks	50	3,000
Total troops	1,00,000	1,70,000

### UNIT - II

3. (a) Write the definition of probability. Explain mutually exclusive or disjoint events.
- (b) With the usual notation find P for a binomial random variable X of n=6 and if  $9P(X=4) = P(X=2)$

OR

4. (a) What is poisson distribution. Under what conditions is it applicable.  
 (b) State and prove addition theorem of probability.

### UNIT - III

5. (a) Show that for a normal distribution Mean, Median and Mode coincides.  
 (b) Define a Gamma variable. Obtain its mean and variance.

OR

6. (a) Define a rectangular variable obtain its mean and variance.  
 (b) Write the relation between Beta and Gamma variate.

### UNIT - IV

7. (a) Distinguish between skewness and kurtosis.  
 (b) Compute mean and variance for the following distribution :

Age under	10	20	30	40	50	60	70	80
# of persons dying	15	30	53	75	100	110	115	115

OR

8. (a) Obtain the relation between central moments and raw moments.  
 (b) The first four moments of a distribution about the value 4 of the variable are  $-1.5$ ,  $17$ ,  $-30$  and  $108$ . Find moments about mean,  $\beta_1$ , and  $\beta_2$

### UNIT - V

9. (a) The coefficient of correlation between two variables X and Y is  $0.48$ . The covariance is  $36$ . The variance of X is  $16$ . Find the standard deviation of Y.  
 (b) Write the properties of regression coefficients.

OR

10. (a) Explain a test procedure for testing the difference of two means.  
 (b) A certain drug is claimed to be effective in curing colds. In an experiment on 164 people with colds, half of them were given the drug and half of them sugar pills. The patients reaction to the treatment's are recorded in the following table. Test the hypothesis that the drug is no better than sugar pill for curing.

	Helped	Harmed	No effect
Drug	52	10	20
Sugar pill	44	12	26

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