VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
M.C.A. I Year II-Semester (Supplementary) Examinations, December-2015

Probability and Statistics

Time: **3** hours

Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** questions from **Part-B***

Part-A (10 X 2=20 Marks)

1. Distinguish qualitative data and quantitative data.

2. State different types of diagrams.

3. Define equally likely events. Give an example.

4. Show that probability of an impossible event is zero.

5. Define Gamma distribution.

6. Define cumulative distribution function. State a property of it.

7. Define mathematical expectation.

8. Define Mode. State its applications.

9. Define null and alternative hypothesis.

10. Show that, if correlation between X and Y is zero, they need not necessarily be independent.

Part-B (5 X 10=50 Marks)
(All bits carry equal marks)

11. a) Given below is the growth of fish (in lakhs of tonnes) over a period of seven years in a State of India. Represent it by a suitable diagram.

Year	:	2000	2001	2002	2003	2004	2005	2006
Marine	:	5.3	8.8	10.9	15.6	16.9	17.2	12.5
Inland	:	2.2	2.8	6.7	8.9	11.3	11.6	8.7

b) Explain methods of collection of Primary Data and Secondary Data.

12. a) A bag contains 25 balls numbered from 1 to 25. One ball is drawn at random. What is the probability that it is neither 5 nor 6.

b) Derive the mean and variance of Binomial distribution.

13. a) State the properties of normal distribution.

b) Ship A makes radio signals to the base and probability of the interval between consecutive signals is Uniformly distributed between 4 hours and 24 hours and is zero outside the range. If Ship A gave a signal, what is the probability that it will make two more signals in the next 12 hours?

14. a) Define Skewness. Explain about skewness measures.

   b) A random variable X has the following probability mass function.

   $$p(x) = e^{-t}(1-e^{-t})^{x-1} \quad ; \quad x = 1, 2, 3, \ldots \ldots$$
   $$= 0 \qquad\qquad\qquad ; \quad \text{otherwise}$$

   where 't' is a real number. Find E(x) and V(x).

15. a) In a particular destroyed laboratory, record of an analysis of Correlation Data is given below:

   Variance of X = 9, Regression equations are 8X - 10Y + 66 = 0, 40X - 18Y = 214.

   Find i) Mean of X and Y. ii) The correlation coefficient of X and Y.

   b) Given below are the blood pressures of 10 patients measured by two technicians.

Patient No.	:	1	2	3	4	.5	6	7	8	9	10
Investigator A	:	70	68	56	75	80	90	68	75	56	58
Investigator B	:	68	70	52	73	75	78	67	70	54	55

   Test at 5% level of significance, whether the two Investigators have same variation in their measurements.

16. a) Three persons are independently shooting at a target. Probabilities of these three persons hitting at the target are, respectively, 0.6, 0.5 and 0.8. What is the probability that at least two of them will hit the target?

   b) Define Random Sampling and explain the methods of Random Sampling.

17. Answer any **TWO** of the following:

   a) State and prove addition property of Gamma distribution.

   b) Write a short note on Kurtosis.

   c) Ten specimens of copper wire drawn from a large lot have the following breaking strength (in kg weight).

   Breaking strength : 578 570 572 568 572 571 570 572
                        596 548

   Based on this data can we say that the sample is drawn from a population with mean breaking strength 578 kg weight. Test at 1% level of significance.

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