

B.Tech II Year I Semester (R13) Regular & Supplementary Examinations December 2015

**PROBABILITY & STATISTICS**

(Common to CSE and IT)

(Use of statistical tables is permitted in the examination hall)

Time: 3 hours

Max. Marks: 70

**PART – A**

(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Define conditional probability.
  - Explain random variable with suitable example.
  - What is the formula of confidence interval?
  - Explain alternative hypothesis.
  - Explain one way classification.
  - Explain two way classifications.
  - What are the defects of quality of manufactured product?
  - What is X-bar chart?
  - Explain about queuing characteristics.
  - Write applications of queuing theory.

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 State and prove Baye's theorem
- OR**
- 3 Find the mean and standard deviation of a normal distribution in which 7% of items are under 35 and 89% are under 63.

**UNIT – II**

- 4 A sample of 64 students has a mean weight of 70 k.gms. Can this be regarded as a sample from a population with mean weight 65 k gms and standard deviation 25 k.gm with level of significance 0.05?
- OR**
- 5 From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. Use chi-square distribution test with level of significance 0.05.

Soft drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumps UP	15	30	65
Fanta	50	60	30

**UNIT – III**

- 6 How to construct an X-Bar and R control chart.
- OR**
- 7 A drilling machine bores with a mean diameter of 0.5230 cm and S.D of 0.0032 cm. Calculate the 2-sigma and 3-sigma upper and lower control limits for means of sample 4 and prepare a control chart.

**UNIT – IV**

- 8 Suppose the National Transportation Safety Board (NTSB) wants to examine the safety of compact cars, midsize cars and full-size cars. It collects a sample of three for each of the treatments (cars types). Using the hypothetical data provided below, test whether the mean pressure applied to the driver's head during a crash test is equal for each types of car. Use  $\alpha = 5\%$ .

Table ANOVA.

	Compact cars	Midsize cars	Full-size cars
	643	469	484
	655	427	456
	702	525	402
X(mean)	666.67	473.67	447.33
S	31.18	49.17	41.68

**OR**

- 9 Explain two way classification in detail.

**UNIT – V**

- 10 Explain M/M/1: (infinity/FCFS) queuing model.
- OR**
- 11 Explain about queuing characteristics and discuss queuing theory.