

B.Tech II Year II Semester (R15) Regular & Supplementary Examinations May/June 2018

PROBABILITY & STATISTICS

(Common to CE, CSE, IT and ME)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- What is the probability of getting an even number in the throw of a die?
- In a binomial distribution consisting of 5 independent trials, probabilities of 1 and 2 successes are 0.4096 and 0.2048 respectively. Find the parameter 'p' of the distribution.
- Explain the critical region and accepting region.
- What is the formula of Z distribution double mean.
- Define small and large sample.
- What is testing? What is the purpose of testing?
- Define statistical quality control.
- What is the R-chart?
- Explain M/M/1.
- Define contingency table.

PART – B

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

UNIT – I

- The mean and variance of a binomial distribution are 4 and $(4/3)$ respectively. Find $P(X \geq 1)$.
- The heights of 1000 students are normally distributed with a mean of 174.5 cm and a standard deviation of 6.9 cm. Assuming that the heights are recorded to the nearest half-cm, how many of these students would you expect to have heights: (i) Less than 160.0 cms? (ii) Between 171.5 and 182.0 cms inclusive? (iii) Greater than or equal to 188.0 cms.

OR

- The probability function of a variate X is:

X	0	1	2	3	4	5	6
P(x)	K	3k	5k	7k	9k	11k	13k

Find k, mean and variance.

- At a checkout counter customers arrive at an average of 1.5 per minute. Find the probabilities that in any given minute of time: (i) At most 4 will arrive. (ii) Exactly 4 will arrive. (iii) At least 4 will arrive.

UNIT – II

- An ambulance service claims that it takes on the average 8.9 minutes to reach its destination in emergency calls. To check this claim, the agency which licenses ambulance services has them timed on 50 emergency calls, getting a mean of 9.3 minutes with a standard deviation of 1.6 minutes. What can they conclude at the level of significance of 0.05?

OR

- To test the claim that the resistance of electric wire can be reduced by more than 0.050 ohm by alloying, 32 values obtained for standard wire yielded a mean of 0.136 ohm and a s.d of 0.004 ohm and 32 values obtained for alloyed wire yielded a mean of 0.083 ohm with a s.d of 0.005 ohm. At the 0.05 level of significance does this support the claim?

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UNIT – III

- 6 To compare the two kinds of bumper guards, 6 of each kind were mounted on a certain kind of compact car. Then each car was run into a concrete wall at 5 miles per hour and the following are the cost of the repairs.

Bumper guard 1 : 107 148 123 165 102 119

Bumper guard 2 : 134 115 112 151 133 129

Use the 0.01 level of significance to test whether the difference between the means of these two samples is significant.

OR

- 7 To determine whether there really is a relationship between an employee's performances in the company's training programme and his or her ultimate success in the job, the company takes a sample of 400 cases from its very extensive files and obtained the results shown in the following table.

Success in job	Performance in training program				
		Below average	Average	Above average	Total
	Poor	23	60	29	112
	Average	28	79	60	161
	Very good	9	49	63	121
	Total	60	188	152	400

UNIT – IV

- 8 (a) What are the differences between control charts for variables and control charts for attributes?
(b) List out the ways of plotting P-chart. Explain the construction and operation of C-chart.

OR

- 9 Explain the use of descriptive statistics in measuring quality characteristics.

UNIT – V

- 10 A TV repair man finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. He repair sets in the order in which they arrive. The arrival of the sets is approximately Poisson with an average of 10 per an eight hour day. Find the repairman's idle time each day. How many jobs are head of the average set just brought in?

OR

- 11 Explain about queuing theory characteristics.
