PVP 12

Code: IT4T4

II B.Tech - II Semester – Regular Examinations - JUNE 2014

PROBABILITY STATISTICS & QUEUING THEORY
(INFORMATION TECHNOLOGY)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) State and prove Bayes theorem. 7 M

   b) The probabilities of X, Y, Z becoming managers are 4/9, 2/9 and 1/3 respectively. The probabilities that the bonus scheme will be introduced if X, Y, Z becomes manager are 3/10, 1/2, 4/5, respectively. If the bonus scheme has been introduced, what is the probability that the manager was appointed was X? 7 M

2. a) In a shooting competition the probability of a man hitting a target is 1/5. If he shoots 5 items what is the probability of hitting the target for twice. 7 M

   b) For a binomial distribution mean = 20, variance = 2, calculate the (i) n ,p ,q and (ii) P(X=5) 7 M

3. a) The mean weight of 500 students in a certain college is 151.16 and s.d is 15 pounds. Assuming that, the weights are normally distributed. Find how many students weight

(i) between 119.5 and 155.5
(ii) more than 160 pounds. 7 M

b) Define exponential distribution and find mean and variance. 7 M

4. a) Explain the following:
i) statistic
ii) parameter
iii) sampling distribution
iv) standard error
v) population
vi)sample 7 M

b) A sample of 900 members has mean 3.4 cms. Is the sample from the population with mean 3.25cms and s.d 2.61cms? Also find 95% confidence interval. 7 M

5. a) Explain the following:
i) Hypothesis and its types.
ii) Types of error
iii) Critical region 7 M

b) Let the probability that a coin will be fall a head with a single task in order to test $H_0: \theta = 1/2$ $H_1: \theta = 3/4$. The coin is tossed 5 times and H_0 is rejected more than 3 heads are obtained. Find the probability of type-1 error and type-II error. 7 M

6. a) Explain the chi-square testing for goodness of fit? 6 M

b) Below are the given the gain in weights (in Kgs) of pigs fed on two diets A and B

Diet A: 25,32,30,34,24,14,32,24,30,31,35,25

DietB:44,34,22,10,47,31,40,30,32,35,18,21,35,29,22

Test if the two diets significantly as regards their effect increase in weight. 8 M

7. a) Define the terms

i)average queue length

ii) Average waiting length

iii) Average numbers of customers in the system 7 M

b) Define M/M/1∞/FIFO and explain it. 7 M

8. In a railway marshaling yard goods trains arrives at 30 trains per day . Assuming that the inter arrival time follows an exponential distribution and distribution is also exponential with an average 36 minutes. Calculate the following:

i) The average number of trains in the queue.

ii) Expected waiting time in the queue.

iii) The probability that the number of trains in the system exceeds 10. 14 M