Code: 21A110110

R21

P.B.R. VISVODAYA INSTITUTE OF TECHNOLOGY & SCIENCE
(Autonomous)

B. Tech I Year I Semester (R 21) Regular Examinations

PROBABILITY AND STATISTICS
(Common to CSE, CSE-AI, CSE-IOT Branches)

Time: 3 hours Max. Marks: 70 M

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks.
Answer all questions in Part A.
Part B consists of 5 Units. Answer any one question from each unit.
Each question carries 12 marks and may have a, b, c as sub questions.

PART – A
(Compulsory Question)
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1 Answer the following: (05 X 02 = 10 Marks)

(a) Find the median from the following: 57,58,61,42,38,65,72,66 [CO1, K2] [02 Marks]
(b) What is the probability for a leap year to have 52 Mondays and 53 Sundays? [CO2, K1] [02 Marks]
(c) If the probability of a defective bolt is 0.2, find (*i*) mean (ii) standard deviation for the distribution of bolts in a total of 400 . [CO3, K2] [02 Marks]
(d) In a big city 325 men out of 600 men were found to be smokers. Does this information supports the conclusion that the majority of men in this city are smokers? [CO4, K2] [02 Marks]
(e) Explain the test procedure for small sample test concerning difference between two means. [CO5, K1] [02 Marks]

PART – B
(Answer all five units, 5 X 12 = 60 Marks)

UNIT – I

2. Find the mean deviation about the mean finite following data

Marks obtained	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
No. of students	5	8	15	16	6

[CO1, K3] [12 Marks]

OR

3. Find the coefficient of correlation between the two variables.

x	50	50	55	60	65	65	65	60	60	60
y	11	13	14	16	16	15	15	14	13	13

[CO1, K3] [12 Marks]

UNIT – II

4 The probabilities that students A, B, C, D solve a problem are $\frac{1}{3}, \frac{2}{5}, \frac{1}{5}$ and $\frac{1}{4}$ respectively. If all of them try to solve the problem, what is the probability that the problem is solved.

[CO2 , K3] [12 Marks]

OR

5. State and Prove Baye's Theorem of Probability. [CO2 , K4] [12 Marks]

UNIT – III

6. a) Two dice are thrown five times. Find the probability of getting 7 as sum (i) at least once (ii) exactly two times iii) $P(1 < X < 5)$.

[CO3 , K4] [06 Marks]

b) Average number of accidents on any day on a national highway is 1.6. Determine the probability that the number of accidents are (i) at least one (ii) at most one [CO3 , K4] [06 Marks]

OR

7. In a distribution exactly normal 7% of items are under 35 and 89% of items are under 63. Find the probability that an item selected at random lies between 45 and 56. [CO3 , K4] [12Marks]

UNIT – IV

8. It is claimed that a random sample of 49 tyres has a mean life of 15200km. This sample was drawn from a population whose mean is 15150kms and a standard deviation of 1200 km. Test the significance at 0.05 level.

[CO4 , K4] [12 Marks]

OR

9. The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches.

[CO4 , K4] [12 Marks]

UNIT – V

10. The heights of 10 males of a given locality are found to be 70,67,62,68, 61,68,70,64,64,66 inches. Is it reasonable to believe that the average height is greater than 64 inches? Test at 5% significance level assuming that for 9 degrees of freedom ($t = 1.833$ at $\alpha = 0.05$).

[CO5 , K3] [12 Marks]

OR

11. Given the following contingency table for hair colour and eye colour. Find the value of χ^2. Is there good association between the two ?

Hair colour					
		Fair	Brown	Black	Total
Eye Colour	Blue	15	5	20	40
	Grey	20	10	20	50
	Brown	25	15	20	60
	Total	60	30	60	150

[CO5 , K3] [06 Marks]