VIGNAN'S Institute of Information Technology (Autonomous)::Visakhapatnam VR20

II B. Tech II Semester Mid-1 Examinations, May - 2022

Course Code: 1000202102 Course Name: Probability and Statistics

Branch: CSE/IT Max. Marks :30M Time: 90 min. Date: 12-05-2022

Question Paper Consists of Part – A and Part – B

Answer all questions

Part – A

Q.No.		QUESTIONS	MARKS
1.	a.	State Baye's Theorem	2M
	b.	If a random variable has a poisson distribution such that P(1)=P(2), find mean of the distribution	2M
	c.	What is the value of correction factor if n = 5 and N = 200.	2M

Part – B

Q.No.		QUESTIONS	MARKS
2.	a.	A function is defined as follows: $f(x)=0, \quad x<2$ $=\frac{1}{18}(2x+3), \quad 2\le x\le 4$ $=0, \quad x>4$ Show that it is a valid density function. Find the probability that a variate having this density will fall in tha interval $2\le x\le 3$.	5M
	b.	In a group of 100 sports car buyers, 40 bought alarm systems, 30 purchased bucket seats, and 20 purchased an alarm system and bucket seats. If a car buyer chosen at random bought an alarm system, what is the probability they also bought bucket seats?	5M
3.	a.	A manufacturer of Hydroxychloroquine (HCQ) drug tablets knows that the molar mass of the HCQ tablets is normally distributed with mean 1.9 g/mol and variance 0.01 g/mol. Find, how many tablets weighing (i) 2 g/mol or more (ii) 2.1 g/mol or more can be expected in a given packet of 1000 tablets.	5M
	b.	A marksman has a probability of 0.9 of hitting a target on a single shot. If the marksman has 40 shots, what is the probability that he hits the target i) at least 35 times ii) between 34 and 36 times iii) 37 times.	5M
4.	a.	A population consist of 4,8,12,16,20,24. Consider all possible samples of size 2 which can be drawn without replacement from the population. Find i)The population mean ii)The population standard deviation iii)The mean of the sampling distribution of means iv)The standard deviation of the sampling distribution of means.	4M

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