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VidyaJyothi Institute of Technology (Autonomous)

(Accredited by NAAC & NBA, Approved By A.I.C.T.E., New Delhi, Permanently Affiliated to JNTU, Hyderabad)
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Subject Code:A23012

B.Tech. II Year I Semester Regular Examination, November-2019

SUBJECT NAME: Probability &Statistics **BRANCH : CSE &IT**

Time: 3 Hours **Max. Marks:75**

Note: This question paper contains two ***Parts A and B.***
Part A is compulsory which carries 25 Marks. Answer all the questions.
Part B consists of 5 questions. Answer all the questions.

Bloom's Level:

Remember	L1	Analyze	L4
Understand	L2	Evaluate	L5
Apply	L3	Create	L6

	PART - A	Bloom's Level	25 Marks
	ANSWER ALL THE QUESTIONS		
1	Define: a) Probability density function b) Probability mass function.	1	2M
2	Given that $f(x)=\frac{k}{2x}$, is a Probability distribution for a random variable X that can take on the values x = 1, 2, 3 and 4. find k	2	3M
3	Define mean of Binomial distribution.	1	3M
4	For a normally distributed variate with mean 30 standard deviation 5, find probability that $26 \le x \le 40$.	1	2M
5	Among 900 people in a state 90 are found to be chapatti eaters. Construct 99% confidence interval for the true proportion	2	3M
6	Find sample size for S.D of 20, error is 3 and level of significance is 5%	1	2M
7	Explain the procedure of one way ANOVA	2	3M
8	Explain about 'F' distribution and write its Properties.	3	2M
9	The Coefficient of rank correlation between marks in statistics and marks in Mathematics obtained by a certain group of students is 0.8. If the sum of the squares of the difference in ranks is given to be 33, then find the number of students in the group.	1	3M
10	Write the Normal Equations for the fitting of a straight line	1	2M
	PART-B	**Bloom's Level**	**50 Marks**
	ANSWER ALL THE QUESTIONS		
11.i)	The probability mass function of a variate X is X: 0 1 2 3 4 5 6 7 8 P(X): a 3a 5a 7a 9a 11a 13a 15a 17a Find a)a b) P(X<3),P(X≥ 3) and $P(0 < X < 5)$ c)Distribution function d) Mean	3	10M
	(OR)		
ii)	For the continuous Probability function $f(x)=k\,x^2e^{-x}$ when $x \ge 0$, find a) k b) Mean c) variance.	3	10M
12.i.a)	The mean and Variance of a binomial distribution are 4 and $\frac{4}{3}$ respectively. Find $P(X \ge 1)$.	2	5M
b)	Given that $P(X=2)=9\ P(x=4)+90\ P(X=6)$ for a Poisson variate X. Find $P(X<2)$	2	5M
	(OR)		
ii.a)	Write the uses of Normal distribution.	1	3M
b)	If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3kgs, how many students have masses. A) Greater than 72 kg B) Less than or equal to 64 kg C)Between 65 an 71 kg inclusive.	2	7M

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13.i)	A Population consists of five numbers 2,3,6,8,11. Consider all Possible samples of size two which can be drawn without replacement from the Population. Find A) The mean of the Population. B) Standard deviation of the Population. C) The mean of the sampling distribution of means. D) The Standard deviation of the sampling distribution of means.	4	10M
	(OR)		
ii)a)	A researcher wants to know the intelligence of student in a school. He selected two groups of students. In the first group there 150 students having mean IQ of 75 with S.D of 15 in the second group there are 250 students having mean IQ of 70 with S.D of 20	4	5M
b)	It is claimed that a random sample of 100tyres with a mean life of 15269 is drawn from a Population of tyres which has a mean life of 15200km and a standard deviation of 1248 km. Test the validity of this claims.	4	5M
14.i)	Below are given the gain in weights(in lbs) of pigs fed on two diets A and B Diet A: 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25, -, -, - Diet B: 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22 Test ,if the two diets differ significantly as regards their effect on increase in weight.	3	10M
	(OR)		
ii)	Give the following contingency table for hair colour and eye colour .Find the value of chi square. Is there good association between the two? Hair colour: Fair / Brown / Black Eye colour: Blue (15, 5, 20); Grey (20, 10, 20); Brown (25, 15, 20)	3	10M
15.i.a)	Fit $y = ab^x$ by the method of least squares to the following data: X: 0, 1, 2, 3, 4, 5, 6, 7 Y: 10, 21, 35, 59, 92, 200, 400, 610	3	5M
b)	Fit a parabola of the form $y = a + bx + cx^2$ for the following data. x: 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 y: 1.1, 1.3, 1.6, 2.0, 2.7, 3.4, 4.1	3	5M
	(OR)		
ii.a)	Calculate the regression equations of Yon X from the following data given below. Price (Rs): 10, 12, 13, 12, 16, 15 Amount demanded: 40, 38, 43, 45, 37, 43 Estimate the likely demand when price is Rs.20.	3	5M
b)	Obtain the rank correlation coefficient for the following data: X: 68, 64, 75, 50, 64, 80, 75, 40, 55, 64 Y: 62, 58, 68, 45, 81, 60, 68, 48, 50, 70	3	5M