VIT
Vellore Institute of Technology

Winter Semester – 2019~2020
Continuous Assessment Test – I
Programme Name & Branch: B.Tech. & M.Tech

Course Code & Name : MAT2001 – Statistics for Engineers
Exam Duration : 90 Minutes

Slot : G2+TG2
Maximum Marks : 50

Answer ALL the Questions

Each question carries equal marks ($5 \times 10 = 50$ Marks)

S. No.	Questions	Marks
1.	The following data relate to the frequency distribution of Intelligence Quotients (I.Q.'s) of 900 school children. Find the lower and upper quartiles, quartile deviation.	[10]

I.Q:	54.5-64.5	64.5-74.5	74.5-84.5	84.5-94.5	94.5-104.5
# children :	3	21	78	182	302

104.5-114.5	114.5-124.5	124.5-134.5	134.5-144.5
207	81	21	5

2.	Calculate the mean, variance and standard deviation for the following frequency distribution, and hence obtain the co-efficient of variation for the following data:								[10]

X:	20–25	25–30	30–35	35–40	40–45	45–50	50–55	55–60	60–65
f :	35	165	215	185	145	105	75	65	45

3.	If the random variable X takes the values 1, 2, 3 and 4 such that $2P(X = 1) = 3P(X = 2) = P(X = 3) = 5P(X = 4)$, find the probability distribution function and cumulative distribution function of X.	[10]
4.	If the joint density for the random variables (X, Y), where X is the unit temperature change and Y is the proportion of spectrum shift that a certain atomic particle produces, is given by $$f(x,y) = \begin{cases} cxy^2, & 0 < x < y < 1; \\ 0, & otherwise, \end{cases}$$ then find (i). the value of c, (ii). $f_{Y/X}(y/x)$, (iii). $f_X(x)$. (iv). $f_Y(y)$, (iv). $E(X)$.	[10]
5.	A random variable X has probability mass function $p(x) = P(X = x) = \frac{1}{2^x}$ for $x = 1, 2, 3, \ldots$. Find the moment generating function and hence obtain the mean and the variance.	[10]

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