Enroll No..... Roll No.....

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Odd Semester Examination-2022(Lateral entry students)

Paper Name: Mathematics-III **Paper Code: BTCSE-311**
Time: 3 Hours **Maximum Marks: 75**

Note: Mobile Phones or programmable calculator or any equipment with memory are not allowed inside the examination hall. Follow proper numbering for answering the questions.

Attempt all questions from section A (7*5=35), Any four questions from section B (4*10=40).

Section-A (Attempt all questions 7*5=35)

Q.N.	Questions	Marks	CO	BL
1	A man draws 3 balls from an urn containing 5 white and 7 black balls. He gets Rs. 10 for each white ball and Rs. 5 for black ball. Find his expectation.	5	CO1	1
2	A normal population has a mean of 6.8 and standard deviation of 1.5. A sample of 400 members gave a mean of 6.75. Is the difference significant ?	5	CO4	4
3	If a random variable has the PDF $f(x)=\begin{cases} ke^{-2x} & if\ x>0 \\ 0, & if\ x\le 0 \end{cases}$ Find (i)value of k (ii) $P(0<X<3)$ (iii)$P(X>0.5)$	5	CO 2	5
4	If the joint distribution of (X,Y) is given by $f(x,y)=\frac{x+y}{21}$, $x=1,2,3$ *and* $y=1,2$ then find the marginal distributions.	5	CO3	5
5	State and prove Mean Ergodic Theorem.	5	CO5	1
6	Find k if $f(x,y)=k(1-x)(1-y), 0<x,y<1$ is the joint density function of (X,Y).	5	CO3	3
7	Two bad eggs are mixed accidently with 10 good ones. Find the probability distribution of the number of bad eggs in 3, drawn at random, without replacement, from this lot.	5	CO2	2

Section- B (Attempt any four questions 4*10=40Marks)

Q.N.	Questions	Marks	CO	BL
1	Find the mean and varience of the PDF $f(x)=\begin{cases} x & for\ \ 0<x<1 \\ 2-x & for\ \ 1<x<2 \\ 0 & otherwise \end{cases}$	10	CO2	5
2	Find the conditional probability density function where Joint probability density function $f(x,y)=8xy$ for $0\le x\le y\le 1$ and $f(x,y)=0, elsewhere$.	10	CO3	4
3	If $X(t)=aCos(\theta t)+bSin(\theta t),\ t>0$ is a random process , where a and b are two independent normal variables with E(a)=E(b) = 0 and var(a) = var(b) = σ^2 and θ is a constant, then find mean and variance.	10	CO5	3
4	Find the power spectral density function of the random process whose autocorrelation function is given by $R(\tau)=e^{-a\tau^2}\cos b\tau$ where a and b are constants.	10	CO5	5
5	In a hospital 475 female doctors and 525 male doctors worked in a week. Do these figures confirm the hypothesis that male doctors and female doctors worked equally in number of hours.	10	CO 4	1
6	A survey was conducted to find the supplies of the consumer durables for the market. It was found that the three major companies A,B and C have market share of 35%, 25% and 40% resp. out of which 2%, 1% and 3% are not upto the satisfaction. A consumer buys a product and is dissatisfied with it. What is the probability that it might be from the company C ?	10	CO1	3

BL-Bloom's Taxonomy Levels

(1. Remembering, 2. Understanding, 3. Applying, 4. Analysing, 5. Evaluating, 6. Creating.)