Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester V

Course Code: **ETC503**   and   Course Name: **Random Signal Analysis**

Time: 1 hour   Max. Marks: 50

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Note to the students: - All the Questions are compulsory and carry equal marks .

Q1.	A bag contains 5 red balls and some blue balls .If the probability of drawing a blue ball is double that of a red ball, then the number of blue balls in a bag is:
Option A:	5
Option B:	10
Option C:	15
Option D:	20
Q2.	A and B are two events such that $P(\overline{A}) = 0.4$ and $P(A \cap B) = 0.2$ Then $P(A \cap \overline{B})$ is equal to
Option A:	0.4
Option B:	0.2
Option C:	0.6
Option D:	0.8
Q3.	A probability density function f(x) for the continuous random variable X is denoted as
Option A:	$\int f(x)dx = \infty$, -1<=x<=1
Option B:	$\int f(x)dx = 1$, -∞<=x<=∞
Option C:	$\int f(x)dx = 0$, -∞<=x<=∞
Option D:	$\int f(x+2)dx = .5$, -∞<=x<=∞
Q4.	A Random Variable X can take only two values, 4 and 5 such that $P(4) = 0.32$ and $P(5) = 0.47$. Determine the Variance of X.
Option A:	8.21
Option B:	12
Option C:	3.7
Option D:	4.8
Q5.	If the probability of hitting the target is 0.4, find mean and variance
Option A:	0.4, 0.24
Option B:	0.6, 0.24

Option C:	0.4, 0.16
Option D:	0.6, 0.16
Q6.	If E(x) = 2 and E(z) = 4, then E(z – x) =?
Option A:	2
Option B:	6
Option C:	0
Option D:	10
Q7.	The suitable graph of probability function of a discrete random variable is
Option A:	Curve
Option B:	Polygram
Option C:	Histogram
Option D:	Probability histogram
Q8.	For larger values of 'n', Binomial Distribution
Option A:	Loses its discreteness
Option B:	Tends to Poisson Distribution
Option C:	Stays as it is
Option D:	Gives oscillatory values
Q9.	Var(4X + 8) is
Option A:	12 Var(X)
Option B:	4 Var(X)+8
Option C:	16 Var(X)+8
Option D:	16 Var(X)
Q10.	If P(1) = P(3) in Poisson's distribution, what is the mean?
Option A:	$\sqrt{2}$
Option B:	$\sqrt{3}$
Option C:	$\sqrt{6}$
Option D:	$\sqrt{7}$
Q11.	If we decide to use Markov analysis to study the transfer of technology,
Option A:	Our study will have only limited value because the Markov analysis tells us "what" will happen, but not "why."
Option B:	Our study will be methodologically flawed.
Option C:	We can only study the transitions among three different technologies.
Option D:	Only constant changes in the matrix of transition probabilities can be

	handled in the simple model
Q12.	Find λ in Poisson's distribution if the probabilities of getting a head in biased coin toss as 3/4 and 6 coins are tossed.
Option A:	3.5
Option B:	4.5
Option C:	5.5
Option D:	6.5
Q13.	Markov analysis assumes that conditions are both
Option A:	Collectively dependent and mutually exclusive.
Option B:	Complementary and collectively exhaustive.
Option C:	Collectively exhaustive and mutually exclusive.
Option D:	Collectively dependent and complementary.
Q14.	A random process is called as stationary in strict sense if
Option A:	Its statistics vary with shift in time origin
Option B:	Its statistics does not vary with shift in time origin
Option C:	Its autocorrelation vary with shift in time
Option D:	Its autocorrelation does not vary with shift in time
Q15.	For a Poisson random variable, λ represents the _____ number of arrivals per time period
Option A:	Maximum
Option B:	Minimum
Option C:	Average
Option D:	Standard deviation of
Q16.	A quantity resulting from an experiment that, by chance, can assume different values is called
Option A:	Random experiment
Option B:	Random sample
Option C:	Random variable
Option D:	Random process
Q17.	For a stationary process, autocorrelation function depends on
Option A:	Time
Option B:	Time difference
Option C:	Does not depend on time
Option D:	Frequency

Q18.	Stochastic process are
Option A:	Random in nature
Option B:	Are function of time
Option C:	Random in nature and are a function of time
Option D:	Discrete samples
Q19.	The Autocorrelation function is maximum at
Option A:	Origin
Option B:	Infinity
Option C:	Origin & infinity
Option D:	One
Q20.	In Markov analysis, the likelihood that any system will change from one period to the next is revealed by the
Option A:	Identity matrix.
Option B:	Matrix of state probabilities
Option C:	Transition-Elasticities
Option D:	Matrix of transition probabilities
Q21.	The condition that a system can be in only one state at any point in time is known as
Option A:	Transient state.
Option B:	Mutually exclusive condition
Option C:	Absorbent condition
Option D:	Collectively exhaustive condition.
Q22.	The covariance of two independent random variable is
Option A:	-1
Option B:	1
Option C:	0
Option D:	Undefined
Q23.	The random variables X and Y have variances 0.2 and 0.5 respectively. Let $Z= 5X-2Y$. The variance of Z is?
Option A:	3
Option B:	4
Option C:	6
Option D:	7
Q24.	Mode is the value of x where f(x) is a maximum if X is
Option A:	Discrete
Option B:	Continues

Option C:	Dependent Discrete
Option D:	Independent
Q25.	What would be the probability of an event 'G' if H denotes its complement, according to the axioms of probability?
Option A:	P (G) = 1 / P (H)
Option B:	P (G) = 1 + P (H)
Option C:	P (G) = 1 – P (H)
Option D:	P (G) = P (H)