These are sample MCQs to indicate pattern, may or may not appear in examination

University of Mumbai
Examination 2020

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: 1hour Max. Marks: 50

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

Q1.	MGF (Moment generating function) is defined as
Option A:	E[exp(x)]
Option B:	E[exp(jx)]
Option C:	E[exp(xt)]
Option D:	E[exp(jxt)]
Q2.	Let X and Y be independent exponential random variables with common parameter λ. Define U = X + Y, V = X – Y. What is the value of determinant of Jacobian matrix
Option A:	-1
Option B:	1
Option C:	2
Option D:	-2
Q3.	Fxy(−∞,y)=Fxy(x,−∞)=………(note where Fxy(x,y) is joint cdf of x and y)
Option A:	0
Option B:	1
Option C:	-1
Option D:	-Infinity
Q4.	Which conditions justify the mutual orthogonality of two random signals X(t) & Y(t)?
Option A:	RXY , (t1, t2) = 0 for every t1 and t2
Option B:	RXY , (t1, t2) = 1 for every t1 and t2
Option C:	RXY = 0, (t1, t2) = 1 for t1 and t2 instants respectively

Option D:	RXY = 1 , (t1, t2) = 0 for t1 and t2 instants respectively
Q5.	Consider the statements given below: A. All SSS (Stationary in Strict Sense) processes are also WSS (Stationary in Wide Sense) B. All the processes that are WSS (Stationary in Wide Sense) are also absolutely SSS (Stationary in Strict Sense)
Option A:	Both A & B are true
Option B:	Both A & B are false
Option C:	A is true & B is false
Option D:	A is false & B is true
Q6.	In poisson distribution mean is
Option A:	Greater than variance
Option B:	Lesser than variance
Option C:	Equal to variance
Option D:	Does not depend on variance
Q7.	Power spectral density (PSD) is ---------------function of frequency
Option A:	Real
Option B:	Imaginary
Option C:	Complex
Option D:	Neither real nor imaginary
Q8.	Zero-frequency Power spectral density (PSD) i.e. Sx (0) value equals area under
Option A:	Autocorrelation function
Option B:	Variance function
Option C:	Mean function
Option D:	Co-variance function
Q9.	Which theorem states that the larger the sample size, the closer the sample mean will be to the mean of the population?
Option A:	Central limit theorem.
Option B:	Law of averages.
Option C:	Basu's theorem.
Option D:	Law of large numbers.
Q10.	According to the central limit theorem, the sampling distribution of the mean can be approximated by the normal distribution:
Option A:	As The Number Of Samples Gets "Large Enough."
Option B:	As The Size Of The Population Standard Deviation Increases.
Option C:	As The Size Of The Sample Standard Deviation Decreases.
Option D:	As The Sample Size (Number Of Observations) Gets "Large Enough."
Q11.	If the standard error of the sample mean is 30, with a sample size of 100, then in order to reduce the standard error of the mean to 15, you would need to _______.
Option A:	Increase The Sample Size To 400
Option B:	Increase The Sample Size To 200

Option C:	Increase The Confidence Level
Option D:	Decrease The Sample Size To 50
Q12.	The time between two successive requests arriving, is called
Option A:	Inter-arrival time
Option B:	Arrival time
Option C:	Poisson distribution
Option D:	Average residual service time
Q13.	One of the most widely used exponential distribution is
Option A:	Passion Distribution
Option B:	Possible Distribution
Option C:	Poisson Distribution
Option D:	Poisson Association
Q14.	A super market has a single cashier. During the peak hours, customers arrive at a rate of 20 customers per hour. The average no of customers that can be processed by the cashier is 24 per hour. Find The probability that the cashier is idle.
Option A:	1
Option B:	0.75
Option C:	0.5
Option D:	0.167
Q15.	A super market has a single cashier. During the peak hours, customers arrive at a rate of 20 customers per hour. The average no of customers that can be processed by the cashier is 24 per hour. Find The average no of customers in the queue system
Option A:	3
Option B:	8
Option C:	5
Option D:	10
Q16.	If the arrival and departure rates in a public telephone booth with a single phone are 1/12 and 1 /14 respectively, find the probability that the phone is busy.
Option A:	0.5
Option B:	0.33
Option C:	0.66
Option D:	1
Q17.	If the inter-arrival time and service time in a public telephone booth with a single-phone follow exponential distributions with means of 10 and 8 minutes respectively, Find the average number of callers in the booth at any time
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q18.	The probability density function of a Markov process is

Option A:	p(x1,x2,x3.......xn) = p(x1)p(x2/x1)p(x3/x2).......p(xn/xn-1)
Option B:	p(x1,x2,x3.......xn) = p(x1)p(x1/x2)p(x2/x3).......p(xn-1/xn)
Option C:	p(x1,x2,x3......xn) = p(x1)p(x2)p(x3).......p(xn)
Option D:	p(x1,x2,x3......xn) = p(x1)p(x2 *x1)p(x3*x2)........p(xn*xn-1)
Q19.	Probability value stands in between
Option A:	0 to infinity
Option B:	May be positive
Option C:	0 to 1
Option D:	-Infinity to +infinity
Q20.	What is the probability of getting a sum 9 from two throws of a dice?
Option A:	1/6
Option B:	1/8
Option C:	1/9
Option D:	1/12
Q21.	Let A and B be two events such that P(A) = 1/5 While P(A or B) = ½. Let P(B) = P. For what values of P are A and B independent?
Option A:	1/10 and 3/10
Option B:	3/10 and 4/5
Option C:	3/8 only
Option D:	3/10
Q22.	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:	5
Option D:	7
Q23.	Previous probabilities in Baye's Theorem that are changed with help of new available information are classified as ___________________
Option A:	Independent Probabilities
Option B:	Posterior Probabilities
Option C:	Interior Probabilities
Option D:	Dependent Probabilities
Q24.	E(X) = λ is for which distribution?
Option A:	Bernoulli's
Option B:	Binomial
Option C:	Poisson
Option D:	Normal
Q25.	E(X) = μ and V(X) = σ^2 is for which distribution?
Option A:	Bernoulli's

Option B:	Binomial
Option C:	Poisson
Option D:	Normal