Program: BE EXTC Engineering

Curriculum Scheme: Revised – 2012

Examination: Third Year Semester : V

Course Code: ETC503 and Course Name: Random Signal Analysis(RSA)

Time: 1-hour Max. Marks: 50

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

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| Q1.  | A variable that can assume any value between two given points is called |
| Option A: | Continuous random variable |
| Option B: | Discrete random variable |
| Option C: | Irregular random variable |
| Option D:  | Uncertain random variable |
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| Q2. | Two events A and B are mutually exclusive and each has zero probability. If event A is known to occur, the probability of the occurrence of event B is |
| Option A: | one |
| Option B: | any positive value |
| Option C: | zero |
| Option D: | any value between 0 to1 |
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| Q3. | Which gives the measure of randomness of the random variable? |
| Option A: | Mean |
| Option B: | Variance |
| Option C: | Standard variance |
| Option D: | PDF |
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| Q4. | If random variables X and Y are independent, then |
| Option A: | F(X, Y ) = F(x)+F(y) |
| Option B: | F(X, Y ) = F(x)F(y) |
| Option C: | F(X, Y ) = F(x) - F(y) |
| Option D: | F(X, Y ) = F(x)/F(y) |
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| Q5. | If E(x) = 2 and E(z) = 4, then E(z – x) =? |
| Option A: | 2 |
| Option B: | 6 |
| Option C: | 0 |
| Option D:  | 4 |
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| Q6. | When two coins are tossed simultaneously, what are the chances of getting at least one tail? |
| Option A: | 3/4 |
| Option B: | 1/4 |
| Option C: | 1/5 |
| Option D:  | 2/5 |
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| Q7.  | Which function is denoted by M x(w)  |
| Option A: | MGF |
| Option B: | MRF |
| Option C: | MCF |
| Option D:  | MDF |
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| Q8.  | In a sample space S, if event A is independent of any other event, then |
| Option A: | P(A) = 1 |
| Option B: | P(A) = 0 |
| Option C: | P(A) = -1 |
| Option D:  | P(A) does not exist. |
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| Q9. | A numerical description of the outcome of an experiment is called a  |
| Option A: | descriptive statistic |
| Option B: | probability function |
| Option C: | variance |
| Option D:  | random variable |
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| Q10.  | If ‘m’ is the mean of a Poisson Distribution, the standard deviation is given by  |
| Option A: | sqrt(m) |
| Option B: | m^2 |
| Option C: | m |
| Option D:  | m⁄2 |
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| Q11.  | If Σ P(x) = k^2 – 8 then, the value of k is? |
| Option A: | 0 |
| Option B: | 1 |
| Option C: | 3 |
| Option D:  | 4 |
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| Q12.  | The shape of the normal curve depends on its |
| Option A: | Mean deviation |
| Option B: | Standard deviation |
| Option C: | Quartile deviation |
| Option D: | Correlation |
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| Q13. | Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A? |
| Option A: | 44⁄69 |
| Option B: | 25⁄69 |
| Option C: | 13⁄24 |
| Option D:  | 11⁄24 |
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| Q14.  | If X is a random variable, Var( X + 2) is:  |
| Option A: | Var(X) |
| Option B: | 2Var(X) |
| Option C: | Var(X) + 2 |
| Option D:  | 2Var(X) ^2 |
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| Q15. | Which of the following is not a true statement about the binomial probability distribution?  |
| Option A: | Each outcome is independent of each other |
| Option B: | Each outcome can be classified as either success or failure |
| Option C: | The probability of success must be constant from trial to trial. |
| Option D:  | The random variable of interest is continuous. |
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| Q16.  | The joint cumulative distribution function is defined as |
| Option A: | F(x, y) = P(X ≤ x, Y ≤ y) |
| Option B: | F(x, y) = P(X ≤ y, Y ≤ x) |
| Option C: | F(x, y) = P(Y ≤ x, X ≤ y) |
| Option D:  | F(x, y) = P(X/Y ≤ y, Y/X ≤ x) |
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| Q17. | The amplitude spectrum of a Gaussian pulse is  |
| Option A: | uniform |
| Option B: | a sine function |
| Option C: | Gaussian Option |
| Option D: | an impulse function |
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| Q18. | What does the spectral density function of any signal specify?  |
| Option A: | Distribution of energy or power |
| Option B: |  Consumption of energy or power |
| Option C: | Conservation of energy or power |
| Option D:  | Generation of energy or power |
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| Q19.  | Which of the following distributions have a Memory less Property?  |
| Option A: | Geometric Distribution |
| Option B: | Normal Distribution |
| Option C: | Binomial Distribution |
| Option D:  | Exponential Distribution |
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| Q20. | The cross correlation RXY(τ |
| Option A: | -RXY(-τ) |
| Option B: | RXY(- τ) |
| Option C: | RYX(τ) |
| Option D: | RYX(-τ) |
|  |  |
| Q21. | 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: | transition-elasticities |
| Option C: | matrix of state probabilities |
| Option D:  | matrix of transition probabilities |
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| Q22.  | Which of the following is a reason to employ queuing theory?  |
| Option A: | To reduce customer wait time in line. |
| Option B: | To reduce service time. |
| Option C: | To generate more arrivals to the system. |
| Option D:  | To reduce worker idle time in line. |
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| Q23. | 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 |
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| Q24.  | White Gaussian noise is passed through a linear narrow band filter. The probability density function of the envelope of the noise at the filter  |
| Option A: | Uniform |
| Option B: | Poisson |
| Option C: | Gaussian |
| Option D:  | Rayleigh |
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| Q25. | The shape of the normal curve depends on its |
| Option A: | Mean deviation |
| Option B: | Standard deviation |
| Option C: | Quartile deviation |
| Option D:  | Correlation |