AR18

CODE: 18ECT206   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, Oct / November-2021

PROBABILITY AND STOCHASTIC PROCESSES

(Electronics and Communication Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Explain Conditional Probability with examples   6M
   b) A box contains 6 Red , 4 White and 5 Black balls. A person draws   6M
      4 balls at random.
      Find the probability that among the balls drawn there is at least one ball of
      each color.

(OR)

2. a) State and prove Bayes' theorem   6M
   b) The probabilities of three students to solve a problem in Statistics are   6M
      0.4, 0.2 and 0.1 respectively, find the probability that the problem to be
      solved

UNIT-II

3. a) Define distribution function and write its properties   6M
   b) If the probability density function of x is   6M

$$f(x) = \begin{cases} k(1 - x^2), 0 < x < 1 \\ 0 \text{ otherwise} \end{cases}.$$

   Find the value of k and the distribution function.

(OR)

4. a) A random variable X is known to have a distribution function   6M

$$F_X(x) = u(x)\left[1 - e^{\frac{-x^2}{b}}\right], \text{ where } b > 0 \text{ is a constant. Find its density function}$$

   b) A random variable X has a probability density   6M

$$f_X(x) = \begin{cases} \left(\frac{\pi}{16}\right)\cos\left(\frac{\pi x}{8}\right) & \text{for} -4 \le x \le 4 \\ 0 & \text{elsewhere} \end{cases}$$

   Find (i) mean of X (ii) variance of X

1 of 2

UNIT-III

5. a) Is the function $F_{X,Y}(x,y) = \begin{cases} 0 & x < y \\ 1 & x \geq y \end{cases}$ a valid joint distribution function?   6M

   Justify your answer

   b) Define marginal and conditional distribution functions and their properties.   6M

(OR)

6. a) Define joint density function and write its properties   6M

   b) The joint probability density function of two random variables X, Y is given   6M
   by $f_{X,Y}(x,y) = u(x)u(y)xe^{-x(y+1)}$.

   Determine $f_X(x/y)$ and $f_Y(y/x)$

UNIT-IV

7. a) Define random process and classify random processes.   6M

   b) A random process is defined by $X(t) = \sqrt{2}\sin(2\pi t + \theta)$ where the random   6M
   phase θ is uniformly distributed on $[0, 2\pi]$. Determine the autocorrelation of
   $R_{XX}(t_1, t_2)$

(OR)

8. a) Define cross correlation function of two jointly wide sense stationary   6M
   random processes and write its properties

   b) Given the autocorrelation function, for a stationary ergodic process with no   6M
   periodic components is

   $R_{XX}(\tau) = 25 + \dfrac{4}{1 + 6\tau^2}$, Find the mean and variance of the process $X(t)$.

UNIT-V

9. a) Explain Power Density Spectrum   6M

   b) A random process has the power density spectrum $S_{XX}(\omega) = \dfrac{\omega^2}{(1 + \omega^2)^3}$.   6M

   Compute the average power in the process

(OR)

10. a) Write the properties of Power Density Spectrum   6M

    b) Determine the auto correlation function of power spectrum   6M

    $S_{XX}(\omega) = \dfrac{2\omega^2 + 13}{\omega^4 + 13\omega^2 + 36}$

AR16

CODE: 16OE2013   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Oct / November-2021
INTRODUCTION TO MAT Lab
(Open Elective)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) List out the data types available in the MATLAB with suitable examples?   7M
    b) List the key features and applications of MATLAB?   7M

(OR)

2. a) Explain different format functions available in the MATLAB and their purpose?   7M
    b) Explain different arithmetic operators available in MATLAB with suitable   7M
        examples?

UNIT-II

3. a) Develop a user defined function to find the mean value for a given set of numbers.   7M
    b) Explain 'one dimensional arrays' in MATLAB with suitable examples   7M

(OR)

4. a) Explain the syntax of a function calling a function with a suitable example.   7M
    b) Determine the results for following commands?   Given   7M
        A = [2 1 3 5 2; 3 4 1 2 3 ;5 -3 1 2 1; -2 3 2 4 -2;] ;
        B = [1 3 5; 4 6 2;2 3 5; 1 -3 3];
        i)   A(2,3)+B(3,2)   ii) A(3,:)   iii) B(:,3)   iv)A(2,:) = [ ]
        v) length(A)   vi) A'   vii)size(B)

UNIT-III

5. a) Write a script file to find minimum number in a given set of 3 input values.   7M
    b) Develop the script file to evaluate the factorial of a given number using 'for' loop.   7M

(OR)

6. a) Write a short note on 'SWITCH' condition statement with a suitable example.   7M
    b) Write a short note on 'nested if' loop with an example.   7M

UNIT-IV

7. a) Explain the commands for integration and differentiation in MATLAB with   7M
        suitable examples.
    b) Explain 'solve' and 'roots' commands in MATLAB with suitable examples.   7M

(OR)

8. a) Develop the code for plotting parabola $y=5x^2$ $0 \le x \le 10$ with suitable labels and title   7M
        of graph.
    b) Develop the code for evaluating the following functions   7M
        i) $\int_1^2 x^2$
        ii) $\frac{dy}{dx}$, at x=2 where $y=3x^2+2x+1$;

UNIT-V

9. a) List the advantages and applications of Simulink.   7M
    b) Develop the Simulink model for the equation $(dv/dt)= m – [(g/k)v^2]$ 7M

(OR)

10.   Develop a Simulink model for RLC series circuit with supply voltage V   7M

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AR16

CODE: 16OE2016   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Oct / November-2021
UNIX AND UTILITIES
(Open Elective)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a	With a block diagram explain an UNIX operating system organization and explain Kernel-Shell relationship.	10M
	b	Explain multi-user capability of UNIX.	4M
		(OR)	
2.	a	Write a short note on UNIX philosophy?	8M
	b	What is the difference between internal command and external command? Explain general format of command with examples.	6M

UNIT-II

3.	a	What is a file? Explain the different types of files as available in UNIX	8M
	b	Write some of the commands used for handling ordinary files. Explain them.	6M
		(OR)	
4.	a	What are file and directory permissions? Explain how directory permissions are used in conjunction with file permissions to determine overall permissions. List out some commands for changing the permissions with an example.	14M

UNIT-III

5.	a	Explain the Korn shell features?	6M
	b	What is the need for redirection? Explain with examples the symbols used for redirection.	8M
		(OR)	
6.	a	What is process? Explain the mechanisms of process creation.	8M
	b	What is the need for Electronic Mail for communication in Unix? Explain with example	6M

UNIT-IV

7.	a	Explain with examples (i) cat (ii) ls (iii) cp (iv) mv	8M
	b	Explain the basic script concepts and expressions.	6M
		(OR)	
8.	a	Describe various control structures with syntax.	10M
	b	Write a shell script to find the average of given 'n' numbers	4M

UNIT-V

9.	a	Explain with examples network related commands (i) ftp (ii) rlogin	8M
	b	Write short notes on X Windows	6M
		(OR)	
10.	a	Explain with examples network related commands (i) ping (ii) telnet.	8M
	b	Write short notes on Window Manager	6M

AR16

CODE: 16OE2017   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Oct / November-2021
IT SYSTEMS MANAGEMENT
(Open Elective)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Describe client-server architecture.	8M
	b)	Explain Infrastructure management activities.	6M
		(OR)	
2.	a)	Explain about evaluation systems.	7M
	b)	List the issues and demands in IT system.	7M

UNIT-II

3.	a)	What are the factors that affect designing IT infrastructure? Explain.	7M
	b)	Explain about Information Technology Infrastructure Library (ITIL).	7M
		(OR)	
4.	a)	Explain about the Patterns for IT systems management.	7M
	b)	Discuss about determining customer's Requirements.	7M

UNIT-III

5.	a)	What is e-Waste disposal? Explain.	7M
	b)	Explain various Models in IT system design.	7M
		(OR)	
6.	a)	Explain about Complexity of current computing.	7M
	b)	Describe various approaches for organization Management.	7M

UNIT-IV

7.	a)	What are the goals of network management? Explain organization and functions of network management.	14M
		(OR)	
8.	a)	Explain in detail about OSI layers and services.	14M

UNIT-V

9.	a)	Why recovery is important? Explain.	6M
	b)	Discuss about Network attached storage.	8M
		(OR)	
10.	a)	Explain in detail about the benefits and types of Storage management.	14M

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Oct / November-2021

SWITCHING THEORY AND LOGIC DESIGN
(Common to EEE & ECE)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Find the 9's complement number of $(10000)_{10}$
    b) Find the 1's complement number of $(1001101.101)_2$
    c) $A + AB = $ _____
    d) $(x+y)(x+y') = $ _____
    e) The number of distinct Boolean expressions of 3 variables is_____
    f) How many variables are eliminated when 8-ones are grouped in K-map of 5-variables
    g) If A, B and C are the inputs of a full adder then the carry is given by _____
    h) How many OR gates are required for an octal-to-binary encoder?
    i) A ring counter with 5 flip flops will have ………. states.
    j) Write the characteristic equation of JK flip-flop.

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) Convert the gray code number 1010000 to the equivalent binary Number   [6M]
    b) What are Self complementing codes? Give examples.   [6M]

(OR)

3.   The message given below has been coded in the Hamming code and   [12M]
        transmitted through a noisy channel. Decode the message assuming that at
        most a single error has occurred in each code word of 7 bits. Assume even
        parity.
                1 0 0 1 0 0 1 0 1 1 1 0 0 1 1 1 1 0 1 1 0 0 0 1 1 0 1 1

UNIT-II

4. a) Determine the complements of the following function.   [6M]
            i. AB+ CD(AB'+CD)   ii. AB(BC'+BC)(AC'+AB)
    b) Express the Boolean function: [6M]
            F(x,y,z) = xy +x'z in a product of maxterm form

(OR)

5. a) Obtain the Dual of the following Boolean expressions.   [6M]
            i. AB'C+AB'D+A'B'   ii. A'B'C+ABC'+A'B'C'D
    b) Find the complement of the following and show that F.F=0 and F+F'=1. .   [6M]
        F=xy'+x'y

UNIT-III

6.   Minimize the the following multiple output functions using K- map.   [12M]
          $f1 = \sum m(0, 2, 6, 10, 11, 12, 13) + d(3, 4, 5, 14, 15)$
          $f2 = \sum m(1, 2, 6, 7, 8, 13, 14, 15) + d(3, 5, 12)$.

                         (OR)

7.   Minimize following function using Tabular minimization.   [12M]
        $F (A, B, C, D) = \sum m(6, 7, 8, 9) + \sum d(10, 11, 12, 13, 14, 15)$.

UNIT-IV

8. a)   Design a full adder circuit using 2 half adders.   [6M]
    b)   Design a 4 bit Parallel adder using full adders.   [6M]

                         (OR)

9.   Implement the following functions using Multiplexer   [12M]
          $F1 = \sum m(2,3,6,8,12)$
          $F2 = \sum m(1,3,5,6,7,8,10)$
          $F3 = \sum m(1,3,4,5,6,13,14)$

UNIT-V

10. a)   What is excitation table? Write the excitation tables for the following flip- [6M]
        flops.
         i. SR flip-flop   ii. JK flip-flop   iii. D flip-flop   iv. T flip-flop
    b)   Differentiate in detail the synchronous and asynchronous sequential [6M]
        circuits.

                         (OR)

11.   Design a Sequential circuit with two T Flip Flops A and B and one input [12M]
        w. When *w*=0, state of the circuit remaining the same. When *w*=1, the
        circuit goes through state transitions from S1 to S2 to S3 to S4 and repeats.