

AR18

CODE: 18ECT206

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech I Semester Supplementary Examinations, January-2020

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 example and also explain total probability theorem 6M
 - b) Suppose that a laboratory test to detect a certain disease has the following statistics. Let A= event that the tested person has the disease B= event that the test result is positive. It is known that $P(B/A) = 0.99$ and $P(B/\bar{A}) = 0.005$ And 0.1 percent of the population actually has the disease. What is the probability that a person has the disease given that the test result is positive? 6M
- (OR)**
2. a) How do you explain statistically independent events using Baye's rule? 6M
 - b) In a certain college, 4% of the men and 1% of the women are taller than 6 feet. Furthermore, 60% of the students are women. Now if a student is selected at random and is taller than 6 feet, what is the probability that the student is women? 6M

UNIT-II

3. a) Define and explain the following distribution and densities with an application. 6M
(i) Exponential (ii) Uniform
 - b) A fair die is tossed. Let X denotes twice the number appearing, and let Y denotes 1 or 3 according as an odd or an even number appears. Find the distribution, expectation, variance and standard deviation of (i) X (ii) Y (iii) XY. 6M
- (OR)**
4. a) Explain moments about origin with examples. 6M
 - b) Explain binominal density and distribution function. 6M

UNIT-III

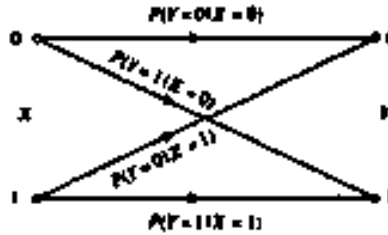
5. a) Define the joint Distribution function and explain the properties of joint Distribution function? 6M
- b) Consider the bivariate r.v. (X, Y) 6M

$$f_{XY}(x, y) = \begin{cases} k(x+y) & 0 < x < 2, 0 < y < 2 \\ 0 & \text{otherwise} \end{cases}$$

Find the conditional pdf's $f_{Y|X}(y|x)$ and $f_{X|Y}(x|y)$.

(OR)

6. a) Explain the central limit theorem? 6M
 b) Consider the binary communication channel shown below. 6M



Let (X, Y) be a bivariate r.v., where X is the input to the channel and Y is the output of the channel. Let $P(X = 0) = 0.5$, $P(Y = 1 | X = 0) = 0.1$, and $P(Y = 0 | X = 1) = 0.2$.

- i) Find the joint pmf's of (X, Y) . ii) Find the marginal pmf's of X and Y .

UNIT-IV

7. a) A random process is defined as $X(t) = A \sin(\omega t + \theta)$ where A is a constant and ' θ ' is a random variable, uniformly distributed over $(-\pi, \pi)$. Check $X(t)$ for stationary. 6M
 b) (i) State and explain various properties of autocorrelation function 6M
 (ii) Define Ergodic process.

(OR)

8. a) Define Poisson random process and represent the autocorrelation of Poisson random process? 6M
 b) Consider a random variable process $X(t) = a \cos \omega t$, where ' ω ' is a constant and A is a random variable uniformly distribution over $(0, 1)$. Find the auto correlation and covariance of $X(t)$? 6M

UNIT-V

9. a) Derive an equation for power spectral density. 6M
 b) Consider a WSS process $X(t)$ with autocorrelation function $R_X(\tau)$ and power spectral density $S_X(\omega)$. Let $X'(t) = dX(t)/dt$. Show that $S_{X'}(\omega) = \omega^2 S_X(\omega)$ 6M

(OR)

10. a) State and explain various properties power spectral density function. 6M
 b) An ergodic random process is known to have an auto correlation function of the form 6M

$$R_{XX}(\tau) = 1 - |\tau|, |\tau| \leq 1$$

$$= 0, |\tau| > 1$$

Show the spectral density is given by

$$S_{XX}(\omega) = \left[\frac{\sin \omega/2}{\omega/2} \right]^2$$

MATRICES AND APPLICATIONS

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 Reduce the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 2 & 4 & 6 \end{bmatrix}$ into Echelon form and determine its rank. 7M

- b Show that the equations 7M

$x+y+z = -3$; $3x+y-2z = -2$; $2x+4y+7z = 7$ are consistent and solve the same.

(OR)

2. Reduce the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & -1 \\ 3 & 1 & 1 \end{bmatrix}$ to Normal form and determine its rank. 14M

UNIT-II

3. Determine the Eigen values and the corresponding Eigen vectors of the matrix 14M

$$A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$$

(OR)

4. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ also determine A^{-1} and A^3 14M

UNIT-III

5. Use LU decomposition to solve the system of equations 14M

$$2x+y+z=10, \quad 3x+2y+3z=18, \quad x+4y+9z=16$$

(OR)

6. Solve the system of equations $3x + y + 2z = 3$; $2x - 3y - z = -3$; $x + 2y + z = 4$ by using matrix inversion method. 14M

UNIT-IV

7. Show that the quadratic form $2x^2 + y^2 - 3z^2 + 12xy - 8yz - 48zx$ is indefinite. **14M**

(OR)

8. Reduce the quadric form to the canonical form by an orthogonal reduction **14M**
 $x^2 + 2y^2 + 2z^2 - 2yz + 2xz - 2xy$

UNIT-V

9. Write the matlab code to solve the linear system of equation **14M**

$$3x + y + 2z = 3; 2x - 3y - z = -3; x + 2y + z = 4$$

(OR)

10. Write the matlab code to find the eigen values and the corresponding eigen vectors of **14M**

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}.$$

AR16

CODE: 16OE2012

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech I Semester Supplementary Examinations, January-2020

WATER SHED MANAGEMENT

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) Define watershed development and its objectives? Explain the need for watershed development in India 7 M
b) Explain the integrated and multi disciplinary approach for watershed management 7 M
- (OR)**
2. a) Define the basic data and inputs useful in implementing a watershed development 6 M
b) Explain the influence of the following characteristics of watershed development 8 M
(i) Physiography (ii) Vegetation (iii) Hydrogeology (iv) Land use

UNIT-II

3. a) Find the types of soil erosion in a watershed and effects of erosion on land fertility 6 M
b) Classify the all soil erosion control measures in a watershed and discuss any two measures in detail 8 M
- (OR)**
4. Explain in detail how the following measures arrest the soil erosion in a watershed 14 M
(i) Furrowing (ii) Gully Control (iii) Bunding (iv) Trenching (v) Ploughing

UNIT-III

5. a) Define in detail about Catchment harvesting and soil moisture conservation 7 M
b) Explain in detail the water harvesting structures? 7 M
- (OR)**
6. a) Explain the soil moisture conservation through artificial recharge techniques 6 M
b) Explain the soil moisture conservation through percolation tanks and farm ponds 8 M

UNIT-IV

7. Explain about the capability classes suitable and unsuitable for cultivation 14 M
- (OR)**
8. a) Discuss about the management of agricultural and wild land in a watershed programme 7 M
b) Explain and Give a brief note on reclamation of saline and alkaline soils 7 M

UNIT-V

9. a) Describe what is an eco system? Explain its significance in a watershed management 7 M
b) Discuss how dry land agriculture and horticulture are managed in an ecosystem 7 M
- (OR)**
10. What is cropping pattern and explain how do you attempt ecosystem management with the Biomass management 14 M

AR16

CODE: 16OE2013

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech I Semester Supplementary Examinations, January-2020

INTRODUCTION TO MATLAB

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) Write a short note on MATLAB desktop windows. 7M
- b) Give the syntax and purpose of commands for managing a session in MATLAB. 7M

(OR)

2. a) Write a short note on data types available with MATLAB. 7M
- b) Write a short note on relational operators with its description. 7M

UNIT-II

3. a) Explain syntax for defining 'user defined function ' in MATLAB with one example. 7M
- b) Write a user defined function in MATLAB to find the roots of quadratic equation $2x^2-6x+3$. 7M

(OR)

4. a) Write a short note on defining matrices in MATLAB. 6M
- b) What is the output for following command(s) if $A = [2 \ 1 \ 5 \ 7]$; $B = [4;1;2;6]$;
 $C = [1 \ 3 \ 5 \ ; \ 3 \ 1 \ 0; \ 2 \ 6 \ 1; \ 3 \ 1 \ 2]$; $D = [1 \ 2 \ 1 \ 4; \ 2 \ 1 \ 4 \ 1; \ 5 \ 2 \ 4 \ 1; \ 7 \ 1 \ 3 \ 0]$;

- i) $A(3)$
- ii) $\text{length}(A)$
- iii) $C(1,2)*\text{length}(B)$
- iv) $D(1:2,2:3)$
- v) $C(:,2)$
- vi) $D(3,:)$
- vii) $C(3,:) = [\]$
- viii) $A*B$

UNIT-III

5. a) Write a short note on usage of conditional statement 'if-else' in MATLAB with one example. 7M
- b) Write a simple MATLAB code for finding the maximum and minimum values in given set of numbers using 'if-else' statement:
 $A = \{2, 3, 7, 1, 5, 9\}$ 7M

(OR)

6. a) Explain the syntax of 'nested for' loop in MATLAB with one example. 7M
 b) Write a simple MATLAB code for finding the maximum and minimum numbers in given set of numbers using 'for' loop: 7M
 $A = \{2, 3, 7, 1, 5, 9\}$

UNIT-IV

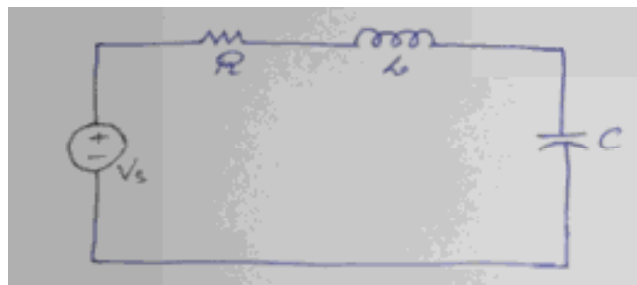
7. a) Explain graphs plotting in MATLAB with good examples. 9M
 b) Write a simple MATLAB code for plotting $y = 2\cos(t)$ for $0 < t < 10$. 5M

(OR)

8. a) Find maxima and minima points for function $F(x) = 2x^3 - 3x^2 + 5$ and write a simple MATLAB code for finding maximum and minimum values of given function. 10M
 b) A 0.5F capacitor is charged by a voltage source and the current flowing through the capacitor is given by $i(t) = 2t - 3$ with initial conditions zero. Write a simple MATLAB code for finding the voltage across capacitor. 4M

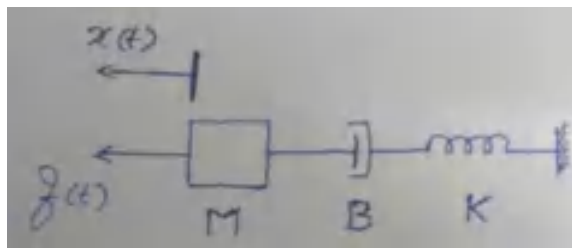
UNIT-V

9. Derive the mathematical modelling equations for the following series RLC circuit and build the Simulink model for the same by considering $R=2\Omega$, $L=1H$ and $C=0.5F$. Assume the current flowing through the inductor $i_L(t)$ and voltage across capacitor $v_c(t)$ as state variables. 14M



(OR)

10. Derive the mathematical modelling equations for the following physical system and build the Simulink model for the same. 14M



AR16

CODE: 16OE2015

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech I Semester Supplementary Examinations, January-2020

INTRODUCTION TO ELECTRONIC MEASUREMENTS

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) Define following static performance characteristics 7M
i) Accuracy ii) resolution iii) precession
b) Draw and explain the series Voltmeter? 7M
- (OR)**
2. a) Define following dynamic performance characteristics 7M
i) Speed of response ii) Lag iii) Fidelity
b) Draw and explain the series ohmmeter? 7M

UNIT-II

3. a) Explain with neat sketch AF sine generator? 7M
b) Draw and explain Harmonic distortion analyzer? 7M
- (OR)**
4. a) Explain with neat sketch function Generator? 7M
b) Draw and explain Wave Analyzer? 7M

UNIT-III

5. a) Draw and explain the Block Diagram of CRO? 7M
b) Explain with neat sketch Digital storage oscilloscope? 7M
- (OR)**
6. a) Write features of CRT? 7M
b) Explain with neat sketch Dual trace oscilloscope? 7M

UNIT-IV

7. a) Draw and explain Maxwell's bridge for Measurement of inductance? 7M
b) A Maxwell bridge consist of Following values $C_1=0.01\mu F$, $R_1=470k\Omega$, $R_2=5.1k\Omega$, $R_3=100k\Omega$ find unknown impedance? 7M
- (OR)**
8. a) Draw and explain Shearing Bridge for Measurement of capacitance? 7M
b) An AC bridge consist of Following values $C_1=0.5\mu F$, $R_1=1k\Omega$, $R_2=2k\Omega$, $C_3=0.5\mu F$ find unknown capacitance and resistance? 7M

UNIT-V

9. a) Define Transducer and classify different transducer with Examples? 7M
b) Explain with neat sketch Linear Variable Differential Transformer? 7M
- (OR)**
10. a) Write short notes on thermocouples? 7M
b) Explain with neat sketch Data acquisition systems? 7M

AR16

CODE: 16OE2016

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2020

UNIX 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 neat sketch, explain the relationship between the kernel and the shell of the UNIX operating system. 8 M
- b Explain features of the UNIX operating system. 6 M

(OR)

2. a How to begin an UNIX operating system? 7 M
- b Explain procedure to change the password of an Existing user? 7 M

UNIT-II

3. a Explain file system structure in UNIX with neat sketch? 6 M
- b Explain the three modes of the Vi-Editor. 8 M

(OR)

4. Explain following Unix commands 14 M
- i) date ii) ls iii) mkdir iv) wc v) cat

UNIT-III

5. a Explain about shell? What are the various types of shells? How to change current shell to another shell from command line area? 10 M
- b Write a short note on Electronic mail? 4 M

(OR)

6. a What is the standard input and standard output? How do you achieve redirection using pipes? Explain with an example. 10 M
- b Write a short note on process ? 4 M

UNIT-IV

7. a Write a short note about shell script? 6 M
- b Write a shell script for perform an arithmetic operation between two numbers? 8 M

(OR)

8. What are the various control structures available in UNIX ? Give example with structures? 14 M

UNIT-V

9. a What is X windows? Write a short note on X windows environment? 8 M
- b How to start an Windows X ? 6 M

(OR)

10. Explain following commands with example? 14 M
- i) finger ii) telnet iii) ftp iv) ping

AR16

CODE: 16OE2017

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

II B.Tech I Semester Supplementary Examinations, January-2020

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) With a neat sketch explain in detail about Von- Neumann Architecture 7M
b) Define IT Infrastructure. Explain IT infrastructure Management Activities 7M
(OR)
2. a) Write about the services of Cloud Computing 7M
b) Explain in brief client- Server Architecture 7M

UNIT-II

3. What is an Organization and Infrastructure? Explain the factors to consider in designing IT Organization and IT Infrastructure 14M
(OR)
4. Explain how the patterns for IT System Management help to facilitate reuse, tested and proven to be successful. 14M

UNIT-III

5. a) Describe the common tasks in IT system Management 7M
b) Explain about People-Process-Technology(PPT) approach in detail 7M
(OR)
6. a) Explain about e-Waste disposal 7M
b) Define Model? Explain about Use Case Diagram in modelling 7M

UNIT-IV

7. a) Explain in detail about Communication Protocols and Standards 7M
b) List out the challenges of IT Managers 7M
(OR)
8. Explain Network Management Goals, Organization and Functions 14M

UNIT-V

9. a) Explain the traditional division of storage hierarchy 7M
b) Explain in detail about Disaster Recovery 7M
(OR)
10. a) Explain Storage Management Process and Activities 7M
b) Explain Backup Requirements and Restore policies 7M

**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) Name two weighted number system.
- b) Write the truth table of XOR gate.
- c) Write the 2's complement of 00101101.
- d) What is AOI logic?
- e) How many cells an n variable K-map have?
- f) What is the use of enable input in decoder?
- g) What are the applications of Multiplexers?
- h) Define flip-flop?
- i) What is a single bit register?
- j) What are the applications of counters?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2. Determine Hamming code for (a) 0110 and (b) 0111 and find the distance between them. Use even parity. 12M

(OR)

3. a Convert the following into the Gray number 6M
(i) $3A7_{(16)}$ (ii) $527_{(8)}$ (iii) $652_{(10)}$
- b Express the numbers $432.2_{(8)}$ and $1101.01_{(2)}$ in base 10 6M

UNIT-II

4. a Show that $AB + (A+B)'$ is equivalent to AOB (xnor). 6M
Also construct the corresponding logic diagrams.
- b State and Prove Associative law 6M

(OR)

5. Expand $A+BC' + ABD' + ABCD$ to min terms and max terms 12M

UNIT-III

6. Minimize the four variable logic function using K-map 12M
 $f(A,B,C,D) = \sum m(0,1,2,3,5,7,8,9,11,14)$
Implement the minimized expression in AOI logic.

(OR)

7. Design a BCD to – Seven segment Decoder. 12M

UNIT-IV

8. Design a Full subtractor and implement the logic diagram using only 2-input NAND gates 12M

(OR)

9. Design a 4 bit binary Adder/Subtractor circuit and explain how addition and subtraction takes place. 12M

UNIT-V

10. With the help of excitation tables convert the SR flip-flop to JK flip flop and D flip-flop 12M

(OR)

11. Design an 4 bit Universal shift register and explain all the mode of the data movement in the register. 12M