AR18

CODE: 18ECT206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

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) State and prove Total probability theorem 6M
   b) If A, B and C are events such that $P(A) = 0.4, P(B) = 0.3$ and $P(A \cup B) = 0.6$, find (i) $P\left(\frac{B}{A}\right)$ (ii) $P\left(\frac{A}{B}\right)$ 6M

(OR)

2. a) If A and B are statistically independent events, prove that (i) A and $\overline{B}$ are statistically independent (ii) $\overline{A}$ and B are also statistically independent 6M
   b) If A, B_1, B_2 are three events of a sample space such that $P(B_1) = 0.6, P(B_2) = 0.4$, $P(A/B_1) = 0.9$ and $P(A/B_2) = 0.1$ find (i) $P(A)$ (ii) $P(B_1/A)$ 6M

UNIT-II

3. a) Define probability density function and write its properties 6M
   b) Explain Gaussion density and distribution function with mathematical expression. 6M

(OR)

4. a) Determine the mean and variance of the density function 6M

$$f(x) = \begin{cases} \frac{1}{b} e^{-\frac{x-a}{b}}, & x > a \\ 0, & x < a \end{cases}$$

   b) Assume that the height of clouds above the ground at some location is a Gaussian random variable X having $a_X = 1750m$ and $\sigma_X = 450m$, find the probability that clouds will be higher than 2650 m. 6M

UNIT-III

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

b) The joint probability density function of two random variables X,Y is 6M

given by $$f_{X,Y}(x,y)=\begin{cases}\dfrac{xy}{4}, & 0\le x\le 2,\ 0\le y\le 2\\ 0, & \text{otherwise}\end{cases}$$

find the marginal density functions $f_X(x)$ and $f_Y(y)$

(OR)

6. a) Given the function $g(x,y)=\begin{cases}b\,e^{-x}\cos y, & 0\le x\le 2 \text{ and } 0\le y\le \dfrac{\pi}{2}\\ 0, & \text{elsewhere}\end{cases}$ 6M

Find the value of the constant b so that $g(x,y)$ is a valid probability density function

b) If X a random variable with mean $E(X)=4$, variance $\sigma_X{}^2=3$ and $Y=5X+1$, determine the Correlation X and Y 6M

UNIT-IV

7. a) Define (i) stationary random process (ii) wide sense stationary random process (iii) ergodic random process 6M

b) Let two random processes $X(t)$ and $Y(t)$ be defined by 6M

$X(t)=A\cos(\omega_0 t)+B\sin(\omega_0 t)$, $Y(t)=B\cos(\omega_0 t)-A\sin(\omega_0 t)$, where A and B are random variables and ω_0 is constant. Find the cross-correlation function $R_{XY}(t,t+\tau)$

(OR)

8. a) Explain auto correlation of two random processes and its properties. 6M

b) Find the mean and variance of stationary random process whose auto correlation function is given by 6M

$$R_{xx}(\tau)=18+\frac{2}{6+\tau^2}$$

UNIT-V

9. a) Derive the relationship between Power spectrum and Auto correlation 6M

b) Compute the power spectrum of a random process $X(t)$, whose auto correlation function given by $R_{XX}(\tau)=\cos 3\tau$

(OR)

10. a) Determine the average power of the random process 6M

$X(t)=A_0\cos(\omega_0 t+\theta)$ where A_0 and ω_0 are constants and θ is a uniformly distributed random variable on $\left(0,\dfrac{\pi}{2}\right)$

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

$$S_{XX}(\omega)=\frac{8\omega^2+47}{\omega^4+13\omega^2+36}$$

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AR16

CODE: 16OE2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Suppl. Examinations, November, 2019

OPEN ELECTIVE

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. Find whether the following system of equations are consistent. If so solve them.

$2x - y + z = 5\,, 3x + y - 2z = -2, x - 3y - z = 2$

(OR)

2. Find the Rank of the matrix A by reducing it to normal form where $A=\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & -4 \\ 2 & 3 & 5 & -5 \\ 3 & -4 & -5 & 8 \end{bmatrix}$

UNIT-II

3. Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$

(OR)

4. Verify Cayley Hamilton theorem for the matrix $A=\begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 5 \end{bmatrix}$ and find A^{-1}

UNIT-III

5. Solve the system of equations by Gauss - Seidal method $10x + y + z = 12, 2x + 10y + z = 13, 2x + 2y + 10z = 14$

(OR)

6. Solve the system of equations by using the LU-decomposition method $x + y + z = 1, 3x + y - 3z = 5, x - 2y - 5z = 10.$

UNIT-IV

7. Find nature of the quadratic form , index and signature of $10x^2 + 2y^2 + 5z^2 - 4xy - 10xz + 6yz$

(OR)

8. Reduce the quadratic form to the canonical form $x^2 + y^2 + 2z^2 - 2xy + 4zx + 4yz$

UNIT-V

9. Write the MATLAB code to find the Eigen values and the corresponding Eigen vectors of $A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$.

(OR)

10. Write the MATLAB code to solve the linear system of equation $3x_1 + 4x_2 - 2x_3 + 2x_4 = 2,$ $4x_1 + 9x_2 - 3x_3 + 5x_4 = 8,$ $2x_1 - 3x_2 + 7x_3 + 6x_4 = 10,$ $x_1 + 4x_2 + 6x_3 + 7x_4 = 2$ by using Gauss elimination method

AR16

CODE: 16OE2013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

OPEN ELECTIVE

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) Explain different relational operators available in MATLAB with suitable examples? 7M
   b) Outline the features and scope of MATLAB? 7M

(OR)

2. a) List different windows available in the MATLAB and the purpose of each of it. 7M
   b) List the broad classification of operators available in the MATLAB. 7M

UNIT-II

3. a) Develop a function to evaluate the average value for a given set of values. 7M
   b) Illustrate 'Nested function' structure; explain with it a suitable example. 7M

(OR)

4. a) Given A=[1 2 3 0;4 5 6 1;7 3 2 1;0 2 4 6;],B=[3 -2 5 3; 2 3 4 0; 7 2 4 2;], C=[1;2;0;-1;-2;] determine the following. 7M
      i) Length of C
      ii) Size of A
      iii) A(1,4)+B(2,3)
      iv)B(3,:)
      v) A(:,2)
      vi)A(1,:) = [ ]
      vii) B([2,3,2,3],:)
   b) Explain 'one dimensional arrays' in MATLAB with suitable examples 7M

UNIT-III

5. a) Write a script file to find minimum number in a given set of values using 'if-else' condition — 7M
   b) Write a short note on 'nested for loop' with an example. — 7M

(OR)

6. Explain the different 'loops' available in MATLAB with examples. — 14M

UNIT-IV

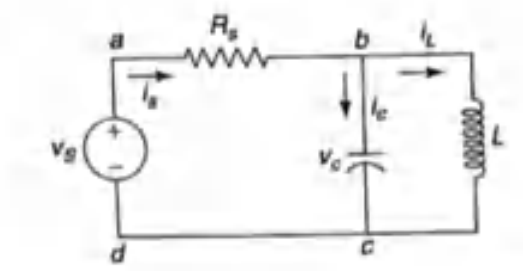
7. a) Write short note on plotting graphs in MATLAB with suitable example. — 7M
   b) Develop MATLAB code for plotting '10cosθ' in the range of $0 \leq \theta \leq 2\pi$ with suitable labels.

(OR)

8. a) Explain the commands 'solve' and 'roots' available in MATLAB with suitable example — 7M
   b) Explain how to define axis properties in MATLAB with suitable example. — 7M

UNIT-V

9. a) Develop Simulink model for a R-L-C series circuit shown in Fig. System parameters are R=25 ohms, L=0.2H, C=200μF and Vs=110V. — 10M



   b) List the advantages of Simulink. — 4M

(OR)

10. Explain developing masking of a block in Simulink with suitable example — 14M

AR16

CODE: 16OE2014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

OPEN ELECTIVE

FUNDAMENTALS OF MATERIAL SCIENCE

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.		Classify engineering materials and explain.	14M
		(OR)	
2.	a)	What are the point defects found in solid materials? Illustrate these defects with suitable sketches.	6M
	b)	Explain two basic types of dislocations.	8M

UNIT-II

3.	a)	Differentiate between elastic deformation and plastic deformation.	4M
	b)	Represent a schematic of twinning mechanism in plastic deformation.	10M
		(OR)	
4.	a)	Discuss the effect of the rate of deformation on the mechanical properties.	7M
	b)	Show the schematic illustration of slip in a single crystal.	7M

UNIT-III

5.		Differentiate between cold working and hot working.	14M
		(OR)	
6.		Explain the following phenomena 1.Recovery 2.Recrystallization 3.Grain growth	14M

UNIT-IV

7.	a)	Describe tensile test on UTM.	10M
	b)	Define the following properties 1.Strength 2.Hardness 3.Toughness 4.Brittleness	4M
		(OR)	
8.	a)	State the advantages of Rockwell hardness test over the other tests of hardness measurement.	6M
	b)	Describe Brinell hardness test with sketch.	8M

UNIT-V

9.	a)	State the differences between Izod test and Charpy test.	8M
	b)	Explain the modes of fracture.	6M
		(OR)	
10.	a)	Explain how a creep test is conducted.	8M
	b)	What are the factors affecting fatigue life?	6M

AR16

CODE: 16OE2015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. I Semester Supplementary Examination, October/November, 2019

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 the following terms in brief. i) accuracy b) resolution c) precision	6M
	b.	Draw and explain Series type voltmeter & Derive the expression?	8M
		(OR)	
2.	a.	What is dynamic characteristic of an instrument? List and explain briefly.	7M
	b.	Explain about different types of errors that occur in measurements and give precautions to eliminate them?	7M

UNIT-II

3.	a.	Draw and explain the circuit of standard and AF sine and square wave generator?	7M
	b.	Explain how function generator generates sine wave, triangular wave and square wave?	7M
		(OR)	
4.	a.	What is a wave analyzer? What is its use? Explain the working of a wave analyzer?	7M
	b.	Draw and explain the block diagram of a Harmonic distortion analyser?	7M

UNIT-III

5.	a.	Explain with neat Block Diagram of Digital Storage oscilloscope?	7M
	b.	Draw and explain briefly the CRT block diagram?	7M
		(OR)	
6.	a.	Explain the working of Dual Beam CRO with neat block diagram.	8M
	b.	Give the specifications of general purpose CRO?	6M

UNIT-IV

7.	a.	With the help of circuit diagram explain how unknown frequency value can be determined using wien's bridge?	7M
	b.	If the wien's bridge constants are R_1=3.1k, R_2=25k, R_4=100k, C_1=5.2µf, C_3=20.3pf, Find the value of frequency of oscillation of the circuit?	7M
		(OR)	
8.	a.	With the help of circuit diagram explain how unknown capacitance value can be determined using Schering's bridge?	7M
	b.	If the bridge constants are R_1=1k, R_2=2k, C_1=0.5µf, C_3=0.5µf, Find the value of unknown values of C_X and R_X?	7M

UNIT-V

9.	a.	Explain the Principle, working, Construction and applications of thermistors?	7M
	b.	With neat sketch explain the working of LVDT?	7M
		(OR)	
10.	a.	With neat sketch explain the working of sensistor?	7M
	b.	What is Transducer? Write the classification of transducers with examples?	7M

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AR16

CODE: 16OE2016 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October/November, 2019

UNIX UTILITIES

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)	Explain UNIX Operating system with neat sketch	8 M
	b)	Describe the salient features of the UNIX operating system.	6 M
		(OR)	
2.	a)	How to start an UNIX system and how to close it?	8 M
	b)	How to change password of an Existing user? Explain with sequence of steps?	6 M

UNIT-II

3.		Explain following Unix commands i) date ii) ls iii) mkdir iv) wc v) cat vi) passwd	14 M
		(OR)	
4.		What are file attributes? Explain how to change basic file permissions, with an example.	14 M

UNIT-III

5.	a)	What are standard input, standard output? Explain with respect to UNIX.	8 M
	b)	Explain briefly different types of shells available in Unix O.S?	6 M
		(OR)	
6.	a)	Explain about mail command in UNIX ? How to write, see and send a mail? What is a 'mail' command? Give any six 'mail' internal commands and explain them	8 M
	b)	Explain about process?	6 M

UNIT-IV

7.	a)	What do you understand by shell variables? Explain briefly.	8 M
	b)	Write a shell script to create a menu, which displays the list of files, current data, Process status and current users of the system.	6 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? i) finger ii) telnet iii) ftp iv) ping	14 M

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AR16

CODE: 16OE2017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. I Semester Supplementary Examinations, October/November, 2019

IT SYSTEMS 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. What is meant by IT? How it is affecting common man life in current generation? 14M

(OR)

2. Write short notes on : Internet , System Software , ALU, Memory 14M

UNIT-II

3. a What is the essence of STO approach (Strategy-Tactics-operations) 7M
   b Describe how crucial to gather customers requirements 7M

(OR)

4. Describe the synopsis of IT Infrastructure lib v2 14M

UNIT-III

5. Describe the Common tasks of ITSM 14M

(OR)

6. a Write the differences between Project and Product 7M
   b What is meant by" clean the Dead code" 7M

UNIT-IV

7. Write the challenges of IT manager? 14M

(OR)

8. Mention key factors of OAMP 14M

UNIT-V

9. Mention the concept of Hierarchical storage management 14M

(OR)

10. What are the requirements of back up? 14M

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AR13

CODE: 13EC2003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEM SUPPL. EXAMINATIONS, October/November,2019

SWITCHING THEORY AND LOGIC DESIGN
(EEE & ECE)

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

PART-A

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

1. a) What is the possible base b in the expression $(128)_{10} = (1003)_b$?
   b) _____ are the number of parity bits in a 12-bit hamming code.
   c) State Demorgan's theorem.
   d) If F(A,B,C) = Σm(1,2,3,5,6). Then what is the complement of F(A,B,C)?
   e) How much number of cells will there in a 6- variable K-map?
   f) Give the implementation of Full adder using half adders and logic gates.
   g) Which logic gate is a basic comparator?
   h) A Decoder can realize any Boolean expression. (True/False)
   i) Give the characteristic equation of a J-K flip-flop.
   j) What is the minimum number of flop-flops required for a mod-12 ripple counter?

PART-B

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

UNIT-I

2. If A = –46 and B = +38, then represent A and B in 8-bit 2's complement. Find (i) A + B (ii) A - B using 2's complement method. **12M**

(OR)

3. a) Represent the decimal numbers 351 and 986 in BCD, and then show the steps necessary to form their sum. **6M**
   b) Generate the Hamming code for the given 11 bit message 10001110101. **6M**

UNIT-II

4. Given the following Boolean function: F(A,B,C,D) = A.B'.D+B.C.D'+ A'B.D' **12M**

   i) Convert the Boolean function into Standard SOP form.

   ii) Obtain the truth table of the function.

   iii) Draw the logic gate diagram for the original Boolean function.

(OR)

5. Simplify the following Boolean expression F = A.B'+A.B.D+A.B.D'+A'.C'.D' and implement them in **12M**

   i) Two level NAND gate circuit ii) Two level NOR gate circuit

UNIT-III

6. Obtain the minimal expression for ΠM(2,3,5,7,9,11,12,14) using K-map method **12M**

(OR)

7. Implement 2-bit multiplier using K-map. **12M**

UNIT-IV

8. a) Discuss the functional principle of 4-bit ripple carry adder. What is its major disadvantage? **6M**

   b) Explain briefly about 4:2 priority encoder. **6M**

(OR)

9. A combinational circuit is defined by the equations **12M**

   Fl = AB + A'B'C' F2 = A.B' + A'B +A' C

   F3 = A'B.C + A.B'.C'

   Implement these three equations using a 8:1 decoder.

UNIT-V

10. a) Give the implementation of JK flip flop using T flip flop **7M**

    b) Describe the functionality of 4-bit SIPO shift register **5M**

(OR)

11. Design a BCD counter using T flip-flops. **12M**

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