AR18

BIOLOGY
(Common to CE, CSE & IT)

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) Describe the fundamental differences between science and engineering using live examples   6M
    b) Discuss how biological observations of 18th century that lead to major discoveries   6M
                                    (OR)
2. a) Define biology and summarize the basic principles of biology in detail.   6M
    b) Discuss the examples of Brownian motion and the origin of thermodynamics   6M

UNIT-II

3. a) Write an essay on classification of microorganisms.   6M
    b) Contrast the difference between procaryotes and eucaryotes.   6M
                                    (OR)
4. a) Define molecular taxonomy and explain about three major kingdoms of life   6M
    b) Classify the organisms based on energy and carbon utilization with suitable examples.   6M

UNIT-III

5. a) Define cell division. Differentiate between mitosis and meiosis.   6M
    b) Explain the Mendel's laws of inheritance.   6M
                                    (OR)
6. a) Describe the genetic interactions with suitable examples.   6M
    b) Describe the salient features of genetic code   6M

UNIT-IV

7. a) Define enzymes and discuss the general properties of enzymes.   6M
    b) Explain about the classification of enzymes along with their functions   6M
                                    (OR)
8. a) Demonstrate the mechanism of enzyme action with suitable examples.   6M
    b) Discuss the functions of proteins along with structure of proteins   6M

UNIT-V

9. a) Explain how thermodynamics apply to biological systems.   6M
    b) Discuss the mechanism of photosynthesis   6M
                                    (OR)
10. a) Differentiate between exothermic and endothermic reactions with examples.   6M
    b) Explain about ATP as energy currency and bring out the important energy yielding and energy consuming reactions in life.   6M

AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March,2022
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 the following   6M
   i) Conditional probability ii) Independent events iii) Discrete sample space
   b) A Pack Contains 4 white and 2 green pencils, another pack contains 3 white and 5 green   6M
   pencils. If one pencil is drawn from each pack, then find the probability that
   i) both are white and ii) one is white and another is green.

(OR)

2. a) State and prove the Baye's theorem   8M
   b) A Letter is taken at random out of "ASSISTANT" and out of "STATISTICS". What is the   4M
   chance that they arethe same letters.

UNIT-II

3. a) Define cumulative probability distribution function. Discuss distribution function specific   6M
   properties.
   b) A random variable X has a probability density $f_x(x) = \frac{1}{2} Cos(x), -\frac{\pi}{2} < x < \frac{\pi}{2}$. Find the   6M
   mean value of the function on $g(x) = 4x^2$.

(OR)

4. a) Explain Gaussion density and distribution function and its important   8M
   b) Find the Moment generating function of Uniform distribution?   4M

UNIT-III

5. a) State and prove central limit theorem?   8M
   b) The joint probability density function of two random variables X and Y is given by   4M
   f(x, y) = C(2x + y), 0 ≤ x ≤ 1, 0 ≤ y ≤ 2. Then find the value of C?

(OR)

6. a) Find value of constant b such that function shown below is a valid joint density   6M
   fxy(x, y) = bx^2y exp(-2xy)u(x-2)u(y-1).
   b) Find the density function of W=X+Y, where the densities of X and Y are assumed   6M
   to be: $f_x(x) = 4u(x)e^{-4x} \quad f_y(y) = 4u(y)e^{-5y}$

UNIT-IV

7. Let two random processes X(t) and Y(t) be defined by X(t) = A cosω_0t + B sinω_0t   12M
   Y(t) = B cosω_0t – Asinω_0t Where A and B are random variables and ω_0 is a constant.
   Assume A and B are uncorrelated, zero mean random variables with same variance. Find
   the cross correlation function Rxy(t, t+τ) and show that X(t) and Y(t) are jointly wide
   sense stationary?

(OR)

8. a) Give the classification of random processes.   6M
   b) A stationary random process has an autocorrelation function given by $R_{xy}(\tau) = \frac{25\tau^2+36}{6.25\tau^2+4}$.   6M
   Find the mean value, mean-square value and variance of the process.

UNIT-V

9. a) State and prove any three properties of power density spectrum?   6M
   b) The autocorrelation function of the random telegraph signal process is given   6M
   by Rx(τ) = a^2 exp(-2b|τ|). Determine the power spectral density of the telegraph signal.

(OR)

10. a) Derive the Wiener-Khintchine relation.   8M
    b) Define cross power density spectrum   4M

AR16

CODE: 16OE2013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March,2022
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 various key features and scope of the MATLAB — 7M
   b) List out relational operators available in MATLAB with one example. — 7M

   (OR)

2. a) List the different data types available in the MATLAB? — 7M
   b) List different windows available in the MATLAB and the purpose of each of it. — 7M

UNIT-II

3. a) Develop an program to find the roots of the quadratic equation X^2-5X+4 using MATLAB. — 7M
   b) Given A=[3 1 -1 2;4 0 5 3;2 5 -2 1;1 7 3 5;],B=[3 -2 5 3; 2 3 4 0; 7 2 4 2;], C=[0;4;5;-3;-2;0] determine the following. — 7M
   i) Length of C ii) Size of A iii) A(2,3)+B(3,1) iv) B(3,:)
   v) A(:,3) vi) B(3,:) = [ ] vii) A([3:4],:)

   (OR)

4. a) Explain the syntax of a function with suitable example. — 7M
   b) Write short notes on defining and reshaping of matrices in MATLAB. — 7M

UNIT-III

5. a) Develop the script file to evaluate the factorial of a given number using 'for' loop. — 7M
   b) Write a short note on 'nested if' loop with a suitable example. — 7M

   (OR)

6. a) Develop the script file to calculate the maximum number for a given set numbers using 'while' loop. — 7M
   b) Write a short note on 'SWITCH' condition statement with a suitable example. — 7M

UNIT-IV

7. a) Develop the code to find maxima and minima with a suitable example — 14M

   (OR)

8. a) Explain the commands for integration and differentiation in MATLAB with suitable examples. — 7M
   b) Develop code for plotting graph '5cos(ωt)' in the range of $0<\omega t<2\pi$ — 7M

UNIT-V

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

   (OR)

10. a) Develop Simulink model for a simple R-L-C series circuit supplied with step input with the following parameters: R=10ohms, L=1mH,C=100μF, V=100V. Assume initial conditions to be zero. — 14M
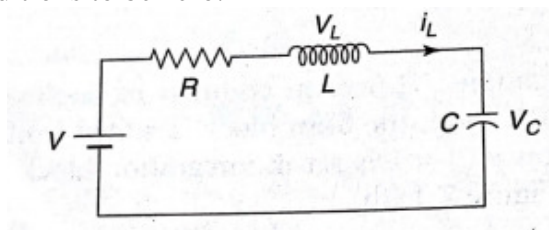
AR16

CODE: 16OE2017   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March,2022
Open Elective
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.	a)	List the issues and demands in IT system.	7M
	b)	Explain about the evolutions of computing systems.	7M
		(OR)	
2.	a)	Describe client-server architecture.	8M
	b)	Discuss about the growth of internet.	6M

UNIT-II

3.	a)	Discuss about IT service management process.	7M
	b)	What are the factors that affect designing IT infrastructure? Explain.	7M
		(OR)	
4.	a)	Explain how to identify system components to manage data.	7M
	b)	Explain about Information Technology Infrastructure Library (ITIL).	7M

UNIT-III

5.	a)	Explain Common tasks in IT system management.	7M
	b)	Explain about the Patterns for IT systems management.	7M
		(OR)	
6.	a)	Explain various Models in IT system design.	7M
	b)	Design the context diagram for IT management systems. Explain.	7M

UNIT-IV

7.	a)	Explain in detail the challenges of IT managers.	10M
	b)	What is the goal of network management?	4M
		(OR)	
8.		Explain in detail about OSI layers and services.	14M

UNIT-V

9.	a)	Explain about disaster recovery.	10M
	b)	What are the benefits of storage management?	4M
		(OR)	
10.		What are various types of Storage management? Write in detail about Network attached storage.	14M

AR13

CODE: 13EC2003   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March-2022

SWITCHING THEORY AND LOGIC DESIGN
(Electrical & Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Implement the Boolean expression using NAND Gates ((A+B) C)'D
    b) Find the minimal SOP and POS expression for the following function
        F (A,B,C,D) = (1,4,5,6,11,12,13,14)
    c) Design a full adder using two half adders and logic gates
    d) Convert the following numbers $(225.225)_{10} = (x)_8$
    e) Realize y=ab+ab'+b'c with basic gates
    f) How does an Ex-OR gate differ from an OR gate in its logical operation.
    g) Distinguish between decoder & demultiplexer.
    h) What is race condition in flip-flops? How it can be eliminated?
    i) Obtain the dual of A(A+B) & A(B.C).
    j) Distinguish between synchronous and asynchronous sequential circuits.

PART-B

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

2. a) Determine the error in the received hamming code 110011. Consider even parity   6M
    b) Find the value of x in the following   6M
        i) $(4058.052)_{10} = (x)_{12}$ ii) $(10111.11)_2 = (x)_{16}$ iii) $(2512)_8 = (x)_2$
                            (OR)
3. a) Find the 1's and 2's complement of the following binary numbers.   6M
        i.   1011101101   ii) 011101110   iii) 10000111
    b) Find the 10's complement of $(539)_{11}$ and 9's complement of $(A8)_{16}$ 6M

UNIT-II

4. a) Find the simplified expression for the Boolean function   6M
        F(A,B,C,D)= $\sum$m (2,3,12,13,14,15)
    b) Implement the function F=AB'+CD'+AB'C+ABCD using universal gates   6M
                            (OR)
5. a) Implement the Boolean function F (A,B,C)=$\sum$m(0,1,3,5) with NAND gates only.   6M
    b) Determine the canonical sum form for f(ABC)=C+($\bar{A}$+B)(A+$\bar{B}$).   6M

UNIT-III

6. a) What are the steps involved in simplification of Boolean function using Quine Mc-clusky method.　　**6M**

   b) Simplify using K- Map F(A,B, C, D)= $\sum m(1,3,7,11,15)+d(0,2,5)$ and implement it with NAND gate　　**6M**

(OR)

7. a) (a) Define the prime implicants and essential prime implicant minimize using tabular method, the given function f(w,x,y,z)= $\sum m(1,4,8,9,13,14,15)$ + $\sum d(2,3,11,12)$　　**7M**

   b) Obtain the simplified expression in SOP and POS for the following Boolean expression $A\bar{B}+ C\bar{D} + A\bar{B}C+ABCD$　　**5M**

UNIT-IV

8. a) Design a combinational circuit that converts a four bit reflected code number to a four bit binary number　　**6M**

   b) Implement the following function with the multiplexer. F(A,B,C,D)= $\sum m(0,1,3,4,8,9,15)$　　**6M**

(OR)

9. a) Design a combinational circuit that generates the 9's complement of a BCD digit .　　**6M**

   b) What is a priority Encoder. Design a 4 to 2 line priority encoder　　**6M**

UNIT-V

10. a) What is a race around condition. Explain 2 solutions for overcoming race around conditions.　　**8M**

    b) What are the design steps of a synchronous counters.　　**4M**

(OR)

11. a) Design a synchronous BCD counter using T flip- flop　　**6M**

    b) What are steps involved in the design of a ripple counter/ N-mod counter. And design modulus 10 ripple counter.　　**6M**