

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All parts of the Question must be answered at one place

UNIT-I

1. a) Reduce the matrix $A = \begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$ into Echelon form and determine its rank. 7M

- b) Show that the following system of equations $x + y + 2z = 4$;
 $2x - y + 3z = 9$; $3x - y - z = 2$ are consistent and solve them. 7M

(OR)

2. Find P and Q such that the normal form of matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 0 & 2 \\ 2 & 1 & -3 \end{bmatrix}$ is PAQ. Hence find the rank of A. 14M

UNIT-II

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

$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

(OR)

4. a) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ and determine A^{-1} 10M

- b) Show that the matrix $H = \begin{bmatrix} 3i & 2+i \\ -2+i & -i \end{bmatrix}$ is a Skew-Hermitian matrix. 4M

UNIT-III

5. a) Calculate three iterations of the power method with scaling to approximate a dominant 7M

eigen vector of the matrix $A = \begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$. Use $x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as the initial approximation.

- b) Solve the system of equations $x + 2y + 3z = 1$; $2x + 3y + 8z = 2$;
 $x + y + z = 3$ by using matrix inversion method. 7M

(OR)

6. Use Gauss-Seidal iteration method to solve the system $10x + y + z = 12$; $2x + 10y + z = 13$; $2x + 2y + 10z = 14$ 14M

UNIT-IV

7. Using diagonalisation reduce the quadratic form $10x^2 + 2y^2 + 5z^2 - 4xy - 10xz + 6yz$ to the canonical form and determine its rank, index, signature and nature. 14M

(OR)

8. a) Using Lagrange's reduction reduce the quadratic form $2x^2 + 7y^2 + 5z^2 - 8xy - 10yz + 4xz$ to the canonical form reduction and determine its rank, index, signature and nature. 8M

- b) Write down the quadratic form corresponding to the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 4 & -2 \\ 3 & -2 & 5 \end{bmatrix}$. 6M

UNIT-V

9. Write the matlab code to solve the linear system of equation $12x - 2y + 3z = 18$; $x + 10y - 2z = 16$; $3x + y + 15z = 52$, by using Gauss elimination method. 14M

(OR)

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

$$A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

AR16

CODE: 16OE2012

SET-2

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

II B.Tech I Semester Regular/Suppl. Examinations, Nov/Dec, 2018

**WATERSHED 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) Explain objectives of the watershed development 6M
b) Discuss about the integrated multi-disciplinary watershed management approach. 8M
(OR)
2. What are the characteristics of watershed and explain any six characteristics which influencing the development of watershed in detail 14M

UNIT-II

3. List out various causes of soil erosion and explain any four causes in detail 14M
(OR)
4. Define accelerated erosion of soil and explain about the Rain drop erosion/Splash erosion, Sheet erosion, Rill erosion and Gully erosion 14M

UNIT-III

5. Describe how the moisture loss is happen in the soils through evapotranspiration and explain how it is conserve by organic matter, spreading manure or compost and green manuring techniques 14M
(OR)
6. a) Discuss about artificial recharge and its advantages 6M
b) Explain the role of check dams and percolation tanks in groundwater recharge 8M

UNIT-IV

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

UNIT-V

9. a) Define an ecosystem and explain it's role in a watershed program 8M
b) Write a shorts note on inter, mixed strip cropping 6M
(OR)
10. What is cropping pattern and explain how do you attempt ecosystem management with the Biomass management 14M

AR16

CODE: 16OE2013

SET-1

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

II B.Tech I Semester Regular/Suppl. Examinations, Nov./Dec, 2018

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 arithmetic operators available in MATLAB with suitable examples? 7M
b) List the different data types available in the MATLAB? 7M
- (OR)**
2. a) List the key features and applications of MATLAB? 7M
b) Explain different format functions available in the MATLAB and their purpose? 7M

UNIT-II

3. a) Write short notes on defining and reshaping of matrices in MATLAB. 7M
b) Given $P = \begin{bmatrix} 3 & 1 & -1 & 2 \\ 4 & 0 & 5 & 3 \\ 2 & 5 & -2 & 1 \\ 1 & 7 & 3 & 5 \end{bmatrix}$, $Q = \begin{bmatrix} 3 & -2 & 5 & 3 \\ 2 & 3 & 4 & 0 \\ 7 & 2 & 4 & 2 \end{bmatrix}$, $R = \begin{bmatrix} 0 & 4 & 5 & -3 & -2 & 0 \end{bmatrix}$ determine the following. 7M
 - i) Length of R
 - ii) Size of P
 - iii) $P(2,3) + Q(3,1)$
 - iv) $Q(3,:)$
 - v) $P(:,3)$
 - vi) $Q(3,:) = [\]$
 - vii) $P([3:4],:)$
- (OR)**
4. a) Develop an program to find the roots of the quadratic equation $X^2 - 3X + 4$ using MATLAB. 7M
b) Explain the syntax of a function with a suitable example. 7M

UNIT-III

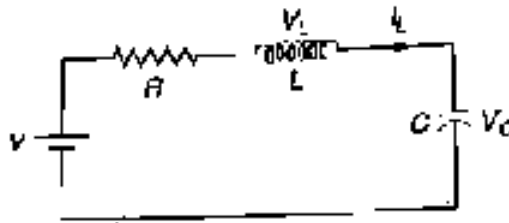
5. Explain the different 'loops' available in the MATLAB with suitable examples 14M
- (OR)**
6. a) Write a script file to arrange the given numbers in the decreasing order. 7M
- b) Write a short note on 'SWITCH' condition statement with a suitable example. 7M

UNIT-IV

7. Develop the code to evaluate the maxima and minima of the function 14M
- $f(x) = x^3 - 6x^2 + 9x + 15$
- (OR)**
8. a) Develop the code for plotting parabola $y = 3t^2$ $0 \leq t \leq 15$ with suitable labels and title of graph. 6M
- b) Develop the code for evaluating the following functions 8M
- i) $\int_1^2 x^2$
- ii) $\frac{dy}{dx}$, at $x=2$ where $y = 5x^2 + 6x + 2$;

UNIT-V

9. a) List the advantages and applications of Simulink. 7M
- b) Develop Simulink model for a simple R-L-C series circuit supplied with step input with the following parameters: 7M
- $R = 10\text{ohms}$, $L = 1\text{mH}$, $C = 100\mu\text{F}$, $V = 100\text{V}$. Assume initial conditions to be zero.



(OR)

10. a) Explain briefly the conversion of mathematical model into a Simulink model with suitable example. 10M
- b) Explain on 'masking' of a 'block' in Simulink. 4M

AR16

CODE: 16OE2014

SET-2

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

II B.Tech I Semester Regular/Suppl. Examinations, Nov./Dec, 2018

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. | What are engineering materials? Explain their classification. | 14M |
| | (OR) | |
| 2. | Classify crystal defects and explain. | 14M |

UNIT-II

- | | | |
|-------|---|-----|
| 3. | Differentiate between slip and twinning mechanism of plastic deformation. | 14M |
| | (OR) | |
| 4. a) | Represent a schematic of slip mechanism in tension. | 8M |
| b) | What is the effect of the rate of deformation on the mechanical properties? | 6M |

UNIT-III

- | | | |
|----|--|-----|
| 5. | Explain cold working and hot working methods and state their merits and demerits. | 14M |
| | (OR) | |
| 6. | Define and explain the following terms:
1.Recovery 2.RecrySTALLIZATION 3.Grain growth | 14M |

UNIT-IV

- | | | |
|----|---|-----|
| 7. | Draw stress-strain diagram for ductile materials indicating the salient points and explain. | 14M |
| | (OR) | |
| 8. | What are the different hardness tests? Describe them in detail. | 14M |

UNIT-V

- | | | |
|--------|---|----|
| 9. a) | Explain Izod and Charpy impact tests in brief. | 8M |
| b) | State the differences between ductile and brittle fracture | 6M |
| | (OR) | |
| 10. a) | Explain various stages of creep curve. | 6M |
| b) | Explain the phenomena of fatigue in metals. How it is measured in practice? | 8M |

AR16

CODE: 16OE2015

SET-1

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

II B.Tech I Semester Regular/Supl. Examinations, Nov./Dec- 2018

OPEN ELECTIVE

INTRODUCTION TO ELECTROINC MEASUREMENT

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 6M
i) Accuracy ii) resolution iii) precision
b) Draw and explain the circuit and operation of shunt type 8M
Ohm meter.

(OR)
2. a) Define following dynamic performance characteristics 6M
i) Speed of response ii) Sensitivity iii) Expected value
b) Explain Thermocouple type Ammeter. 8M

UNIT-II

3. a) Explain with neat sketch function Generator? 7M
b) Draw and explain Wave Analyzer? 7M

(OR)
4. a) Explain with neat sketch AF sine generator? 7M
b) Draw and explain Harmonic distortion analyzer? 7M

UNIT-III

5. a) List and briefly explain CRT features 6M
b) Explain with neat sketch Digital storage oscilloscope? 8M

(OR)
6. a) Draw and explain the Block Diagram of CRO? 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 Wheatstone consist of Following values $R_1=4k\Omega$, $R_2=5k\Omega$ $R_3=100k\Omega$ find unknown resistance R_x ? 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-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supl. Examinations, Nov./Dec- 2018

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

UNIT-II

- | | | | |
|-------------|--|--|------|
| 3. | Explain following Unix commands with examples
i) date ii) ls iii) mkdir iv) wc v) cat vi) passwd | | 14 M |
| (OR) | | | |
| 4. | What are UNIX file attributes? And how to change basic file permissions, give 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 | Write short note on mail command in UNIX ? How to write and send a mail? Give any six 'mail' options and explain with an example. | 8 M |
| | b | What an UNIX 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 v) arp | | 14 M |

AR16

CODE: 16OE2017

SET-1

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

II B.Tech I Semester Regular/Supl. Examinations, Nov./Dec, 2018

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. Write about the Von Neumann architecture of stored memory computer with neat sketch? 14M

(OR)

2. a Write about Super computers? 7M
b Mention the features of mainframes 7M

UNIT-II

3. a Describe how crucial to gather customers requirements 7M
b Explain the term ROI 7M

(OR)

4. Draw and explain the structure of patterns for e-Business 14M

UNIT-III

5. a List out the common tasks of ITSM 7M
b Narrate the role of Use case diagram in modelling 7M

(OR)

6. a Is e-Waste disposal is a burning issue to this planet , explain? 7M
b How Refactoring is helpful to IT industry? 7M

UNIT-IV

7. Mention the top goals of network management 14M

(OR)

8. Short notes on: Protocols, HTTP,EMAIL,SNMP 14M

UNIT-V

9. a Test plan of “Disaster Recovery” 10M
b In storage management, How often to backup? 4M

(OR)

10. a Short notes on Archive 6M
b Short notes on : Tertiary storage 8M
Offline Storage

AR13

CODE: 13EC2003

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.TECH I SEM SUPPL. EXAMINATIONS, NOV./DEC, 2018

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) The eight bit 2's complement form of $(-23)_{10}$ is _____.
- b) What is the parity type of the binary number 11011001?
- c) Which logic gate is given by the following logic operation, "If and only if all of the inputs are on, the output will be off"?
- d) How many minimum number of 2 -input NAND gates are required to realize the Boolean function $Y=A.B+C.D$.
- e) Minimize the following Boolean function
 $A+AB+ABC+ABCD+----$
- f) What is the principle of De-Multiplexer?
- g) Which type of 4-bit adder circuit eliminates carry ripple delay?
- h) Which combinational circuit is called a distributor?
- i) Give the difference between latch and flip-flop.
- j) What is the functionality of Johnson counter?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Perform the following **6M**
 - i) $(137.64)_{10} = ()_6 = ()_2$
 - ii) $(1111.1011)_2 = ()_8 = ()_{16}$
 - b) Write the equivalent $(743)_{10}$ in BCD, 2421 and 6421 codes. **6M**
- (OR)**
3. Detect and correct errors if any in the Hamming codes and write the correct code. **12M**
 - (i) 1100110 (ii) 0011101

UNIT-II

4. a) Express the following function in sum of minterms and product of maxterms **6M**
 $F(A,B,C) = B'.C + A'.C + B.C'$
- b) Simplify the following Boolean expressions to a minimum number of literals
- i) $X'.Y' + X.Y + X'.Y$ ii) $X'.Y + X.Y' + X.Y + X'.Y'$
- (OR)**
5. Implement all logic gates using only NOR gates. **12M**

UNIT-III

6. a) Implement 3-bit gray code to binary code converter. **6M**
- b) Using K-map minimize the following Boolean function **6M**
 $F(A, B, C, D, E) = \sum m(0, 5, 6, 8, 9, 10, 11, 16, 20, 25, 26, 27)$
- (OR)**
7. Simplify the following Boolean function using tabular method. **12M**
 $F(W,X,Y,Z) = \sum m(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$

UNIT-IV

8. a) Explain the operation of full subtractor? Implement full subtractor using half subtractor and logic gates. **6M**
- b) Implement the three-variable Boolean function using a 8-to-1 multiplexer **6M**
 $F(A, B, C) = A.C' + A.B'.C + A.B.C'$
- (OR)**
9. a) Describe the functionality of 4-bit BCD adder using a neat diagram. **6M**
- b) Write a short note on seven segment display. **6M**

UNIT-V

10. Design a mod 7 asynchronous counter using JK flip-flop. **12M**
- (OR)**
11. a) Convert S-R flip flop to D-flip flop **7M**
- b) Discuss briefly about 4-bit control buffer register **5M**