

# AR16

**CODE: 16OE2011**

**SET-2**

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

**II B.Tech I Semester Supplementary Examinations, January-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. Solve the system of equations

$$x + 3y - 2z = 0, 2x - y + 4z = 0, x - 11y + 14z = 0$$

**(OR)**

2. Find the non-singular matrices P and Q such that the normal form of A is PAQ where  $A = \begin{bmatrix} 1 & 3 & 6 & -1 \\ 1 & 4 & 5 & 1 \\ 1 & 5 & 4 & 3 \end{bmatrix}$

## **UNIT-II**

3. Verify Cayley Hamilton theorem for the matrix

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 0 & 1 & -1 \\ 3 & -1 & 1 \end{bmatrix} \text{ and find its inverse.}$$

**(OR)**

4. Find the Eigen values and the corresponding Eigen vectors of the matrix  $A = \begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$

### UNIT-III

5. Find largest Eigen value and the corresponding Eigen vector of the matrix using the power method  $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$

(OR)

6. Solve the system of equations by using the LU-decomposition method  $-3x + 12y - 6z = -33, x - 2y + 2z = 7, y + z = -1$ .

### UNIT-IV

7. Reduce the quadratic form  $7x^2 + 6y^2 + 5z^2 - 4xy - 4yz$  to the canonical form.

(OR)

8. Find the transformation which will transform  $4x^2 + 3y^2 + z^2 - 8xy - 6yz + 4xz$  into a sum of squares and find the reduced form.

### UNIT-V

9. Write the MATLAB code to solve the linear system of equation  $a_{11}x + a_{12}y + a_{13}z = b_1; a_{21}x + a_{22}y + a_{23}z = b_2; a_{31}x + a_{32}y + a_{33}z = b_3$ , by using Gauss elimination method.

(OR)

10. Write the MATLAB code to find the Eigen values and the corresponding Eigen vectors of  $A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$

# AR16

**CODE: 16OE2012**

**SET-1**

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

**II B.Tech I Semester Supplementary Examinations, January-2019**

**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) Define watershed and discuss the concept of watershed development 6M  
b) Explain about the need of watershed development in India 8M  
(OR)
2. Discuss how the watershed is influenced by the characteristics of shape and size, climate, land use, geology and soil, hydrogeology and slope 14M

## **UNIT-II**

3. a) Define soil erosion and Discuss the factors affecting soil erosion 8M  
b) Explain effects of erosion on land fertility and land capability in detail. 6M  
(OR)
4. Discuss in detail about Erosion control methods with a neat sketch: Furrowing, trenching, bunding and terracing. 14M

## **UNIT-III**

5. a) Define rain water harvesting and explain it's merits. 8M  
b) Explain how do you harvest Rain water from rooftop? Explain with sketch 6M  
(OR)
6. a) Discuss the soil erosion control through percolation tanks and form ponds 8M  
b) Discuss the soil erosion control through gully control works 6M

## **UNIT-IV**

7. Describe the terms Land use and Land capability? Explain in detail about the classification of land capability 14M  
(OR)
8. Discuss about the management of forests and grass land in a watershed programme 14M

## **UNIT-V**

9. a) Discuss about the cropping pattern for soil enrichment in a watershed program? 6M  
b) Explain the crop husbandry and sustainable agriculture in a watershed programme 8M  
(OR)
10. How do you attempt ecosystem management with the Biomass management and dry land agriculture 14M

# AR16

**CODE: 16OE2013**

**SET-2**

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

**II B.Tech I Semester Supplementary Examinations, January-2019**

## **INTRODUCTION TO MATLAB (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) Write a short note on features and applications of MATLAB. 7M  
b) Give the syntax and purpose of commands for working with the system. 7M

**(OR)**

2. a) Explain 'format' command(s) with its description. 5M  
b) Write a short note on arithmetic type of operators available in MATLAB. 9M

### **UNIT-II**

3. a) Explain 'function calling another function' with one example. 8M  
b) Write a simple MATLAB code to create user defined function for finding average value of given set of numbers. 6M

**(OR)**

4. a) Write a short note on defining vectors in MATLAB with one example. 6M  
b) What is the output for the following command(s) if  $A = [2 \ 1 \ 5 \ 7]$ ;  $B = [4; 3; 7; 1]$ ;  
 $C = [4 \ 1 \ 5 \ ; \ 3 \ 9 \ 0; \ 2 \ 1 \ 1; \ 3 \ 1 \ 5]$ ;  $D = [3 \ 1 \ 2 \ 1; \ 2 \ 1 \ 1 \ 1; \ 5 \ 2 \ 4 \ 1; \ 7 \ 1 \ 3 \ 0]$ ;  
i)  $C(2,2)$   
ii)  $D(3,1)*B(2,1)$   
iii)  $D(2:3, 2:4)$   
iv)  $B'$   
v)  $C(1,:) = [ \ ]$   
vi)  $A.*B'$   
vii)  $A*B$   
viii)  $\text{length}(A)$

### **UNIT-III**

5. a) Write a short note on conditional statement 'nested if' in MATLAB with one example. 8M  
b) Write a simple MATLAB code for finding even and odd numbers in given set of numbers using 'if' condition:  $A = \{ 5, 2, 6, 1, 9, 7, 4 \}$  6M

**(OR)**

6. a) Explain the syntax of 'for' loop in MATLAB with one example. 7M  
 b) Write a simple MATLAB code for finding standard deviation of given set of values:  $A = \{ 3, 1, 6, 3, 6, 7, 4 \}$  7M

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

Where  $\sigma$  is the standard deviation

$\mu$  is the mean for the given set of numbers

#### UNIT-IV

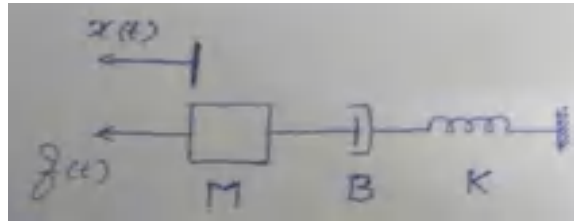
7. a) Explain 'roots' and 'solve' commands in MATLAB with examples. 10M  
 b) A 2H inductor is charged by a voltage source and the charging current flowing through the inductor is given by  $i(t) = 2t^2 - 3t$ . Write a simple MATLAB code for finding the voltage across inductor. 4M

(OR)

8. a) Explain graphs plotting in MATLAB with good examples. 10M  
 b) Correct the following commands: 4M  
 i) `xlable(' time in seconds ')`  
 ii) `title( energy distribution curve )`  
 iii) `ylabel( voltage across capacitor )`  
 iv) `axis(0 10 0 100)`

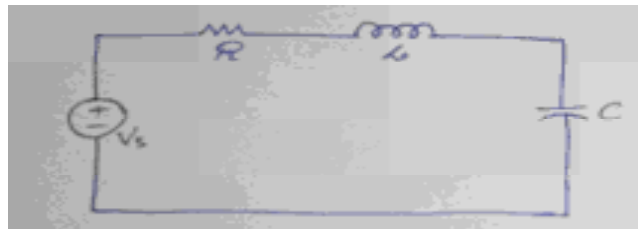
#### UNIT-V

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



(OR)

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



# AR16

**CODE: 16OE2014**

**SET-2**

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

**II B.Tech I Semester Supplementary Examinations, January-2019**

**FUNDAMENTALS OF MATERIAL SCIENCE  
(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.          | Briefly explain about one dimensional defect?                             | 14M |
| <b>(OR)</b> |   |     |
| 2.          | Classify crystal imperfections and explain any two crystal imperfections? | 14M |

**UNIT-II**

- |             |   |     |
|-------------|---|-----|
| 3.          | Briefly explain about the deformation by twinning and slip mechanism?         | 14M |
| <b>(OR)</b> |   |     |
| 4.          | What are the deformation mechanism and explain deformation of single crystal. | 14M |

**UNIT-III**

- |             |   |     |
|-------------|---|-----|
| 5.          | What are the advantages and disadvantage of hot working and cold working? | 14M |
| <b>(OR)</b> |   |     |
| 6.          | Briefly explain about solidification mechanism ?                          | 14M |

**UNIT-IV**

- |             |   |     |
|-------------|---|-----|
| 7.          | Draw the stress strain diagram for mild steel material and explain various curves in stress strain diagram?   | 14M |
| <b>(OR)</b> |   |     |
| 8.          | Define following terms<br>A. Stress B. Strain C. Hardness D. Modules of elasticity E. Proof stress<br>F. Ductility G. malleability H. Toughness I. Isotropic J. Homogeneity | 14M |

**UNIT-V**

- |             |  |     |
|-------------|--|-----|
| 9.          | Define fatigue and briefly explain about the fatigue test? | 14M |
| <b>(OR)</b> |  |     |
| 10.         | Briefly explain about the Izod impact test?                | 14M |

# AR16

**CODE: 16OE2015**

**SET-2**

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

**II B.Tech I Semester Supplementary Examinations, January-2019**

**INTRODUCTION TO ELECTROINC MEASUREMENT  
(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) Define following static performance characteristics 6M  
i) Sensitivity ii) Error iii) Expected value  
b) Draw and explain the series type Ohmmeter? 8M  
(OR)
2. a) Explain about different types of errors that occur in measurements and explain how to eliminate them? 7M  
b) Draw and explain the multi range DC voltmeter? 7M

## **UNIT-II**

3. a) Explain with neat sketch AF sine and square wave 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 Dual beam oscilloscope? 7M  
(OR)
6. a) List and briefly explain CRT features 6M  
b) Explain with neat sketch Digital storage oscilloscope? 8M

### **UNIT-IV**

7. a) Draw and explain Maxwell's bridge for Measurement of inductance? 7M  
b) A Maxwell bridge consist of Following values  $C_1=0.01\mu\text{F}$ ,  $R_1=470\text{k}\Omega$ ,  $R_2=5.1\text{k}\Omega$   $R_3=100\text{k}\Omega$  find unknown impedance? 7M  
(OR)
8. a) Draw and explain Wien Bridge for Measurement of frequency? 7M  
b) Draw and explain Anderson Bridge for Measurement of frequency? 7M

### **UNIT-V**

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



# AR16

**CODE: 16OE2017**

**SET-2**

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

**II B.Tech I Semester Supplementary Examinations, January-2019**

## **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)       | Define Network? Explain Growth of Internet and its Application            | 7M |
| b)          | Define IT Infrastructure. Explain IT infrastructure Management Activities | 7M |
| <b>(OR)</b> |   |    |
| 2. a)       | Explain about Cluster Computing and Grid Computing                        | 7M |
| b)          | Write about the services of Cloud Computing                               | 7M |

### **UNIT-II**

- |             |   |     |
|-------------|---|-----|
| 3.          | Explain in detail about Information Technology Infrastructure Library(ITIL)               | 14M |
| <b>(OR)</b> |   |     |
| 4. a)       | What is an Organization? Explain the factors to consider in designing IT Organization.    | 7M  |
| b)          | Explain the process of identifying customer's requirements in designing process strategy. | 7M  |

### **UNIT-III**

- |             |  |    |
|-------------|--|----|
| 5. a)       | Explain about Strategy-Tactics-Operations (STO) approach in detail | 7M |
| b)          | Explain about System Context diagram in brief                      | 7M |
| <b>(OR)</b> |  |    |
| 6. a)       | Describe the common tasks in IT system Management                  | 7M |
| b)          | Explain about Models in IT System Design                           | 7M |

### **UNIT-IV**

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

### **UNIT-V**

- |             |   |    |
|-------------|---|----|
| 9. a)       | Explain about Hierarchical storage management | 7M |
| b)          | Explain about Archive and Retrieve            | 7M |
| <b>(OR)</b> |   |    |
| 10. a)      | Explain in detail about Disaster Recovery     | 7M |
| b)          | Explain the mechanism of Back up Process      | 7M |