AR18

CODE: 18CET420   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular Examinations, June, 2022
DISASTER MANAGEMENT
(Civil 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) Write briefly about the concepts of hazard, risk, vulnerability, and capacity.   6M
   b) Examine various types of natural disasters and discuss their nature.   6M

(OR)

2. a) Discuss the impact of disasters on the environment.   6M
   b) Outline the measures that are necessary for the prevention of disasters.   6M

UNIT-II

3. Explain the impact of predictable disasters, like cyclones and urban flooding, and the precautions people should take to save themselves from its impact.   12M

(OR)

4. a) Explain the term earthquakes and discuss its impact.   6M
   b) Explain the term landslide and discuss its impact.   6M

UNIT-III

5. How disasters impact environmental and social conditions. Explain.   12M

(OR)

6. Elaborate on the disaster mitigation strategies (i) Hazard mapping (ii) Vulnerability analysis (iii) Mitigation measures (iv) Development control.   12M

UNIT-IV

7. Define the post-disaster stage and explain the measures that are considered under the post-disaster rehabilitation stage?   12M

(OR)

8. a) Discuss how early warning system can reduce the impact during pre-disaster stage.   6M
   b) What are the measures considered under the pre-disaster planning stage   6M

UNIT-V

9. List and discuss the major actions under the reconstruction phase.   12M

(OR)

10. a) Explain the role of state government in recovery measures.   6M
    b) Discuss the role of National Disaster Management Authority role in recovery measures.   6M

AR18

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) List the advantages and disadvantages of digital control system   6M
    b) Sketch the sample and hold circuit and explain its operation.   6M
    (OR)
2. a) State sampling theorem and explain its importance   6M
    b) What is meant by zero order hold? Derive the transfer function of zero order hold device.   6M

UNIT-II

3. a) Obtain the Z-transform of the following functions   6M
        (i) Unit step function   (ii) Sinusoidal function
    b) State and prove any two important theorems of z-transform   6M
    (OR)
4. a) Evaluate the inverse z-transform of the function $\dfrac{3z^2 + z}{(5z-1)(5z+2)}$ 6M
    b) Solve the difference equation by use of the z- transform method,   6M
        x(k+2) + 3x(k+1)+ 2x(k) = 0, x(0) = 0, x(1) = 1

UNIT-III

5. a) Analyse the stability of the following system using bilinear transformation   6M
        $P(z) = z^3 + 1.3z^2 + 0.8z - 2.4 = 0$
    b) Find whether the following discrete time system is completely observable or not?   6M
        $x(k+1) = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} x(k),\ y(k) = \begin{bmatrix} 1 & 2 \end{bmatrix} u(k)$

    (OR)

6. a) Analyse the stability of the following system using Jury's stability test   6M
        $P(z) = z^3 - 1.25z^2 - 1.375z - 0.25 = 0$
    b) A linear dynamic time invariant system is represented by   6M

        x(k+1)=Ax(k)+ Bu(k), where $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix}$, B $= \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$

        Find whether the system is completely controllable or not?

UNIT-IV

7. a) Find the state space representation for the discrete time system
$y(k+3)+6y(k+2)+10y(k+1)+8y(k)=20u(k)$ 6M

    b) Obtain the state space representation for the pulse transfer function,   6M
$$\frac{Y(z)}{U(z)}=\frac{10}{z(z+2)^2(z+4)}.$$

(OR)

8. a) Obtain the state space representation of the pulse transfer function such that the state matrix is diagonal.   6M
$$\frac{Y(z)}{U(z)}=\frac{z^3+8z^2+17z+8}{(z+1)(z+2)(z+3)}$$

    b) Define the following terms   6M
    i) State   ii) State variable   iii) State vector

UNIT-V

9. a) Define state transition matrix and list its properties.   6M
    b) x(k+1)=Ax(k)+ Bu(k) and y(k)= Cx(k)+ Du(k) Compute state transition matrix using Z transform method.   6M

(OR)

10. A discrete system is described by the difference equation   12M
$y(k+2)+3y(k+1)+2y(k)=r(k)$

$y(0)=y(1)=0, T=1sec.$

    (a) Determine a state variable model for the system.
    (b) Find the state transition matrix

AR18

CODE: 18MEE461   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular Examinations, June, 2022
POWER PLANT ENGINEERING
(Mechanical 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) Describe the working of Flat Plate and Parabolic solar collectors with neat diagrams.   6M
   b) Write a short on various conventional and non- conventional sources of energy with their applications.   6M

(OR)

2. a) Explain the working of fuel cell with a neat sketch   6M
   b) What are the functions & uses of wind mills? State different types of wind Mills.   6M

UNIT-II

3. a) Give the classification of ash handling systems. Explain about mechanical handling system.   6M
   b) Describe the working of central pulverized coal burning system with appropriate diagram.   6M

(OR)

4. a) Explain any two types of stokers used in thermal power plant with sketches.   6M
   b) Explain the working of cooling system in thermal power plant with neat layout.   6M

UNIT-III

5. a) Draw a neat line diagram of a diesel power plant showing all the systems and explain the working.   6M
   b) What are the various factors need to be considered while selecting the site for establishing a diesel engine power plant?   6M

(OR)

6. a) Discuss the advantages of combined cycle power generation. Explain the working of GT-ST combined cycle plant. 6M

   b) Discuss various performance characteristics of I.C Engines 6M

UNIT-IV

7. a) Define the term spillway and discuss its requirement. What are the different types of spillways? 6M

   b) Describe the construction and working of a BWR plant with a neat sketch. 6M

(OR)

8. a) Explain various methods for disposal of radioactive waste material. 6M

   b) Discuss the factors considered in selecting a prime mover for a hydro-electric plant. 6M

UNIT-V

9. A power station has to supply load as follows: 12M

Time (hrs)	0-6	6-12	12-14	14-18	18-24
Load (Mw)	30	90	60	100	50

   (i) Draw the load curve (ii) Draw the load-duration curve
   (iii) Calculate load factor and plant capacity factor.

(OR)

10. a) Explain the following terms in detail: 6M
    (i) Connected load   (ii) Diversity factor
    (iii) Plant capacity factor.

    b) Describe the procedure of reducing the power generation cost 6M

AR18

UNIT-I

1.	a)	Explain the importance of Unconventional Machining Processes.	6 M
	b)	Discuss the classification of Unconventional Machining Processes.	6 M

(OR)

2.	a)	Explain USM with a neat diagram.	6 M
	b)	Explain Magnetostrictive transducer.	6 M

UNIT-II

3.	a)	Explain the working of an Abrasive Jet Machine with the help of a neat sketch.	6 M
	b)	Discuss the different variables which control the abrasive flow finishing process?	6 M

(OR)

4.	a)	Explain water jet machining (WJM) system.	6 M
	b)	List the advantages and disadvantages of WJM system.	6 M

UNIT-III

5.	a)	What are the advantages of Electro Chemical Machining process?	6 M
	b)	What are the tool design aspects in Electro Chemical Machining process?	6 M

(OR)

6.	a)	How is the MRR determined in the Electro Chemical machining process?	6 M
	b)	Explain the process Chemical Honing, with a neat sketch.	6 M

UNIT-IV

7.	a)	Explain the operating principle of circuits in Electro Discharge Machining.	6 M
	b)	Explain the MRR parameters and list out advantages of EDM process.	6 M

(OR)

8.	a)	Describe with a neat sketch the working of a Wire EDM.	6 M
	b)	Explain the metal removing mechanism in Electro Discharge Machining process.	6 M

UNIT-V

9.	a)	Explain the equipments used in Electron Beam Machining (EBM) process.	6 M
	b)	Draw and label the parts of the Laser Beam Machine.	6 M

(OR)

10.	a)	Explain the principle and operation of Plasma Arc Machining.	6 M
	b)	Discuss the metal removal mechanism in Plasma Arc Machining.	6 M

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AR18

CODE: 18ECE452   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular Examinations, June, 2022
SATELLITE COMMUNICATIONS
(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)	List the various applications of Satellite Communications.	2 M
	b)	Explain about space segment and ground segment in satellite communication.	10 M

(OR)

2.	a)	List out the frequency bands utilised for satellite services? Mention also different satellite services used in service mapping the frequency band?	4 M
	b)	What are orbital elements? Explain in detail on six orbital elements of satellite from Newton's law of motion?	8 M

UNIT-II

3.	a)	Define Elevation angle and derive the Expression for it.	6 M
	b)	Discuss in detail orbital effects in Communication system performance.	6 M

(OR)

4.	a)	What is orbit transfer? Describe the steps involved in launching a satellite?	8 M
	b)	What is the difference between Expendable Launch vehicle and Reusable Launch vehicle?	4 M

UNIT-III

5.		Explain in detail about telemetry, tracking, command and monitoring system.	12 M

(OR)

6.	a)	Explain about attitude control system.	6 M
	b)	Explain how orbit control is obtained in spinner and 3-axis stabilized satellite systems.	6 M

UNIT-IV

7.	a)	Explain in detail on Onboard signalling operations in Satellite switched TDMA?	12 M

(OR)

8.	a)	Illustrate the Ku band downlink design	6 M
	b)	Derive the expression for C/N ratio of a satellite link.	6 M

UNIT-V

9.	a)	Explain in detail on Earth station tracking system?	6 M
	b)	What are the various types of antennas used at earth station? Explain anyone with a neat diagram.	6 M

(OR)

10.	a)	Draw and explain the receiver subsystem for multicarrier earth station.	6 M
	b)	Discuss the coverage and frequency considerations with regard to low earth orbits.	6 M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B. Tech II Semester Regular Examinations, June, 2022
DIGITAL IMAGE PROCESSING
(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 fundamental steps in digital image processing which can be applied to images.	6M
	b)	Explain the theory of sampling of an image.	6M

(OR)

2.	a)	Define an image. List out and explain the various areas of applications of image processing.	6M
	b)	Explain the concept of gray levels in digital image processing.	6M

UNIT-II

3.	a)	What is Haar Transform? Write the procedure to determine the Haar transformation matrix.	6M
	b)	Explain the slant transform. Derive the slant transform for N=8.	6M

(OR)

4.	a)	Construct Walsh basis for N=4.	6M
	b)	Explain the following two properties of 2D-DFT: i) Convolution ii) Correlation	6M

UNIT-III

5.	a)	Define histogram equalization. Explain the procedure for histogram equalization.	6M
	b)	Explain Spatial filtering in Image enhancement.	6M

(OR)

6.	a)	Explain image smoothing using ideal low pass filters and Butterworth low pass filters.	6M
	b)	Illustrate homomorphic filtering approach for image enhancement.	6M

UNIT-IV

7.	a)	Explain the concept of Inverse Filtering and mention the limitations of it.	6M
	b)	Explain about image restoration using minimum mean square error filtering.	6M

(OR)

8.	a)	Discuss about RGB colour model.	6M
	b)	What is Pseudocolor image processing? Explain.	6M

UNIT-V

9.	a)	Explain the significance of thresholding in image segmentation.	6M
	b)	Explain in detail about detection of Discontinuities.	6M

(OR)

10.	a)	Explain the methods of removing the redundancy.	6M
	b)	Draw the block diagram of lossless predictive coding model and explain it.	6M

AR18

CODE: 18CSE462   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular Examinations, June, 2022
SOFTWARE TESTING METHODOLOGIES
(Information Technology)

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 role of control flow graph in testing a software and compare with flowchart?   8M
   b) Differences between Verification and Validation   4M

(OR)

2. Explain all dichotomies   12M

UNIT-II

3. a) What is data flow model? Explain the various components of data flow model.   6M
   b) Explain the following strategies in dataflow testing   6M
   1. ADUP 2. ACU+P   3.APU+C

(OR)

4. a) Explain in detail about Data Flow Anomalies.   6M
   b) Explain the following Complications Of Transaction Flow Graphs   6M
   [1] Births   [2] Mergers

UNIT-III

5. a) Relate Bug assumption with domain testing.   6M
   b) Discuss the importance of regular expression in software testing.   6M

(OR)

6. a) Briefly explain about regular expressions and flow-anomaly detection.   6M
   b) Explain various properties related to Nice-domains.   6M

UNIT-IV

7. a) Write about (i) Black box testing technique   (ii) Garbage in, Garbage out (GIGO)   6M
   b) How decision tables will be helpful in logic based testing gives various components of it? Explain.   6M

(OR)

8. a) Explain the use of KV charts in logic reduction. Minimize the following Boolean function $F(A, B, C, D) = \Sigma m(0, 1, 2, 5, 7, 8, 9, 10, 13, 15)$ 6M
   b) Explain different laws of Boolean Algebra   6M

UNIT-V

9. a) Describe node reduction Algorithm in Graph Matrix with Example   6M
   b) What is Relation ? Explain the different properties of relation.   6M

(OR)

10. a) Discuss the usage of JMeter and Selenium tools for Regression testing   6M
    b) Explain the following   6M
    [i] The Powers of a Matrix [ii] Define relation [iii] Problem with Pictorial Graphs

AR18

CODE: 18CSE464   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular Examinations, June, 2022
HUMAN COMPUTER INTERACTION
(Computer Science and 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)	Discuss the chronological history of the internet	6M
	b)	What are mental models, and why are they important in interface design?	6M
		(OR)	
2.	a)	Compare a 1970's screen, a 1980's screen, and a 1990's and beyond screen	6M
	b)	Provide the Principles of user interface.	6M

UNIT-II

3.	a)	Explain in detail various legal issues that are to be considered seriously while designing a User Interface.	6M
	b)	Explain in detail the goals of Language design.	6M
		(OR)	
4.	a)	Elaborate about Determining Basic Business functions	6M
	b)	List various direct and indirect methods for determining the requirements	6M

UNIT-III

5.	a)	Discuss the issues and challenges involved in designing menus for small display units.	6M
	b)	What are the various functions of menu	6M
		(OR)	
6.	a)	What are the different types of menus? Explain	6M
	b)	Write about navigation schemes in menus	6M

UNIT-IV

7.	a)	Discuss different window presentation styles	6M
	b)	Suggest How to Select the Proper Kinds of Windows	6M
		(OR)	
8.	a)	Explain various window operations.	6M
	b)	Explain the window management	6M

UNIT-V

9.	a)	Explain Color and human vision relation with an example.	6M
	b)	Explain color palette ,defaults and customization of colors	6M
		(OR)	
10.	a)	The proper use of colour in screen design suggests something to avoid, what are they explain	6M
	b)	Explain Choosing Colors for Textual Graphics Screens	6M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, June, 2022
AIR POLLUTION CONTROL
(Civil Engineering)

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 Air Pollution. Explain Significance of study of Air Pollution Episodes.	**8M**
	b)	Explain in detail about point and Non- Point sources of Air Pollution.	**6M**

(OR)

2.	a)	Differentiate between Primary and Secondary Air pollutants.	**8M**
	b)	Explain in detail about stationary and mobile sources with examples.	**6M**

UNIT-II

3.	a)	Explain in detail various effects of Air pollutants on man.	**7M**
	b)	What is meant by Green House effect? Explain causes and effects in detail.	**7M**

(OR)

4.	a)	Explain in detail various effects of Air pollutants on materials.	**7M**
	b)	What is meant by Heat Islands? Explain in detail causes and effects of Heat Islands.	**7M**

UNIT-III

5.	a)	What are the various conventional methods used for the Flue gases Stack Monitoring? Explain in detail.	**7M**
	b)	Write Indian Air Emission Standards Industrial and Residential areas.	**7M**

(OR)

6.	a)	What are the various parameters checked during Ambient Air Quality monitoring? Explain in detail.	**7M**
	b)	What is meant by Micro meteorological monitoring? Explain in detail.	**7M**

UNIT-IV

7.	a)	Explain in detail about equipment modifications for control of particulate pollutants.	**7M**
	b)	Explain about Electrostatic Precipitators with neat sketch.	**7M**

(OR)

8.	a)	Explain construction and working of Fabric filters with neat sketch.	**8M**
	b)	Explain in detail about Process Changes for control of particulate pollutants.	**6M**

UNIT-V

9.	a)	How do you control the emission of NOx by various adsorption methods? Explain in detail	**7M**
	b)	Explain various wet methods of removal and recycling of SO2 and NO2	**7M**

(OR)

10.	a)	How do you control the emission of SO_2 by various absorption methods? Explain in detail	**7M**
	b)	Explain In-plant Control Measures for removal of gaseous pollutants.	**7M**

AR16

CODE: 16EE4030   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, June, 2022
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

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) Describe the operation of zero order hold device.   7M
    b) Compare the merits and demerits of digital control systems with analog control systems.   7M

(OR)

2. a) Define sampling and explain the process of sampling.   7M
    b) Illustrate the process of ideal sampling.   7M

UNIT-II

3. a) Find the inverse Z-transform of $F(Z) = \dfrac{1}{z(z-2)(z-0.1)}$, $F(Z) = \dfrac{z^2+2z+3}{(z-3)(z-1)}$ 10M

    b) Give the limitations of Z-transform.   4M

(OR)

4. a) Find the pulse transfer function for the following system with unity feedback. $G(s) =$ 7M
       $1/(s+1)(s+2)$. Assume a sampling switch in the forward path.
    b) State and explain initial value theorem.   7M

UNIT-III

5. a) Write down the rules in Jury stability criterion.   7M
    b) Check the stability of the system with the characteristic equation   7M

    $$z^4 - 1.7z^3 + 1.04z^2 - 0.268z + 0.024 = 0$$

(OR)

6. a) A discrete-data control system is described by the state equation   7M

    $x(k+1) = A\ x(k) + B\ u(k)$ where $A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0.5 & 0 \\ 1 & 0 & 2 \end{bmatrix}$; $B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$, Determine the state

    controllability of the system.
    b) Explain Controllability and Observability   7M

UNIT-IV

7. a) Solve the following difference equation using the Z- transforms method.   8M
       $y(k+2)+7y(k+1)+4y(k)=u(k)$; where $y(0)= 0$, $y(1)=0$, T=1sec.
    b) Explain the need of state space approach compared to transfer function approach.   6M

(OR)

8.   The pulse transfer function of digital control system is given by   14M
          $G(z)=\ 10z+3/(z^2+3z+6)$
       Obtain state space representation for the system.

UNIT-V

9.   Consider the following system   14M

    $$\frac{Y(z)}{X(z)} = \frac{z+1}{(z^2 + 1.3z + 0.4)}$$

    Obtain the state space representations of controllable and observable canonical forms.

(OR)

10. a) Obtain the state transition matrix of the following discrete time system   10M
          $X(k+1) = G\ x(k) + H\ u(k)$
          $Y(k) = C\ x(k)$
          Where, $G= \begin{bmatrix} 0 & 1 \\ -2 & -2 \end{bmatrix}$ $H= \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ C= [1 0]

    b) Give the properties of state transition matrix.   4M

AR16

CODE: 16ME4039   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June, 2022
POWER PLANT ENGINEERING
(Mechanical Engineering)

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) What are the conventional and non- conventional sources of energy?   7M
   b) What are the advantages and limitation of tidal power generation   7M

(OR)

2. a) Explain the working of thermo electric power generation   7M
   b) Explain the working of vertical axis wind turbine with a neat sketch.   7M

UNIT-II

3. a) Enumerate and explain the steps involved in coal handling.   7M
   b) What are the different ash handling systems? And explain mechanical handling system.   7M

(OR)

4. a) Explain the working of central pulverized coal burning system with a neat sketch.   7M
   b) With a neat sketch and explain the working of (i) Chain stoker (ii) Spreader stoker   7M

UNIT-III

5. a) Draw a neat line diagram of a diesel power plant showing all the systems and explain the working   7M
   b) Mention the advantages and disadvantages of diesel power plant over a gas turbine power plant?   7M

(OR)

6. a) Discuss the advantages of combined cycle power generation. Explain the working of GT-ST combined cycle plant. 7M
   b) What are the various factors to be considered while selecting the site for diesel engine power plant? 7M

UNIT-IV

7. a) What is a spillway? Why are spillways required? What are the different types of spillways? 7M
   b) Explain with a neat sketch a pumped storage hydro plant, state its advantages 7M

(OR)

8. a) Enumerate and explain the essential components of a nuclear reactor. 7M
   b) Explain about sodium-graphite reactor with a neat sketch 7M

UNIT-V

9. A power station has to supply load as follows:

Time (hrs)	0-6	6-12	12-14	14-18	18-24
Load (Mw)	30	90	60	100	50

14M

(i) Draw the load curve
(ii) Draw the load-duration curve
(iv) Calculate load factor and plant capacity factor

(OR)

10. a) What do you understand by load factor and capacity factor? When are they numerically equal? 7M
    b) What are the various costs involved in power plant? Discuss briefly. 7M

AR16

CODE: 16EC4036   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, June-2022

RADAR ENGINEERING
(Electronics and Communication Engineering)

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 the monopole radar system by using the proper block diagram.	7
	b)	Derive the radar equation and shows the significance of each term in that equation	7
		(OR)	
2.	a)	Elaborate unambiguous range, second time around echo, minimum detectable signal, radar range, pulse repetition frequency.	7
	b)	Describe the principle of integration of pulses and explain its significance.	7

UNIT-II

3.	a)	With a neat block diagram explain the operation of CW radar and describe the operation of non-zero IF receiver.	7
	b)	What are the receiver bandwidth requirements in a typical doppler radar?	7
		(OR)	
4.	a)	Describe the methodology of measuring range and doppler measurement using FMCW radar with the help of a neat diagram.	7
	b)	Explain the working and principal of FMCW altimeter.	7

UNIT-III

5.	a)	With the help of functional block diagram, explain the moving target indicator processing and its purpose.	7
	b)	Elaborate the concept of delay line cancellers in MTI radars	7
		(OR)	
6.	a)	Describe the working and principle of non-coherent MTI radar with neat diagram.	7
	b)	Give the differences between MTI and Pulse Doppler Radar.	7

UNIT-IV

7.	a)	Explain the working of a sequential lobbing-based tracking radar.	7
	b)	Elaborate various types of scanning patterns in radars.	7
		(OR)	
8.	a)	Describe the operation of amplitude comparison mono pulse tracking radar.	7
	b)	Give the comparison of various tracking schemes.	7

UNIT-V

9.	a)	What is the significance of Matched filter and derive the response of matched filter in radar receivers?	7
	b)	Write a short note on Noise Figure and Noise Temperature.	7
		(OR)	
10.	a)	Describe the significance of duplexers in radars, describe the operation of branch type duplexer with neat diagrams.	7
	b)	Write a short note of various types of displays used in radar receivers.	7

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, June, 2022
HUMAN COMPUTER INTERACTION
(Computer Science and Engineering)

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)	What are the principles of user interface design? Explain in detail.	7M
	b)	Explain Advantages and Disadvantages of Graphical Systems	7M

(OR)

2.	a)	Illustrate the concept of indirect manipulation	7M
	b)	What are the different characteristics of GUI	7M

UNIT-II

3.	a)	Explain the obstacles and pitfalls to interface interaction	7M
	b)	Discuss about the importance of user's tasks and needs in the design	7M

(OR)

4.	a)	How to organize screen elements, Explain in detail.	7M
	b)	Write a short note on determining basic business functions	7M

UNIT-III

5.	a)	What are different types of graphical menus? Explain its navigation schemas	7M
	b)	How to write clear text and messages, Explain in detail.	7M

(OR)

6.	a)	Define Menu. Explain different structures and functions of Menus in detail	7M
	b)	Explain Structures of Menus in detail	7M

UNIT-IV

7.	a)	What are the guidelines for selecting proper device based controls? Explain	7M
	b)	What are characteristics of device based controls.	7M

(OR)

8.	a)	Explain components and presentation styles of window	7M
	b)	Explain the various types of windows with suitable examples.	7M

UNIT-V

9.	a)	Write about proper multimedia colours	7M
	b)	Explain about Choosing Colours for Statistical Graphics Screens	7M

(OR)

10.	a)	How to choose colours for textual graphics screens? Explain in detail	7M
	b)	What are the possible problems in choosing colours for screen design	7M

AR13

CODE: 13ME4034   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, June, 2022

INDUSTRIAL AUTOMATION
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

<u>**PART-A**</u>

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

1. a) State any two types of automation.
    b) Expand the USA principle.
    c) Define Mechanical buffer storage.
    d) State any two linear work part transfer mechanisms.
    e) Define balance efficiency.
    f) Provide a definition of material handling.
    g) Name three categories of automated guided vehicles.
    h) What is a re-circulating conveyor?
    i) State any two basic components of a coordinate measuring machine.
    j) State any two rapid prototyping techniques.

<u>**PART-B**</u>

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

<u>**UNIT-I**</u>

2. a) What are some of the reasons why companies automate their operations and explain them?   **[6 M]**
    b) Discuss briefly about automation migration strategy.   **[6 M]**

(OR)

3. a) What is programmable automation and what are some of its features?   **[7 M]**
    b) Describe the hydraulic and pneumatic components used in automation   **[5 M]**

<u>**UNIT-II**</u>

4. a) What are the three basic control functions that must be accomplished to operate an automated production line?   **[6 M]**
    b) A rotary worktable is driven by a Geneva mechanism with five slots. The driver rotates at 48 rev/min. Determine (a) the cycle time,(b)available process time, and (c) indexing time each cycle.   **[6 M]**

(OR)

5. a) Why are storage buffers used on partially automated production lines?   **[4 M]**

    b) A ten-station transfer machine has an ideal cycle time of 30 sec. The frequency of line stops is 0.075 stops per cycle. When a line stop occurs, the average down time is 4 min. Determine (a) average production rate in pc/hr,(b) line efficiency, and (c)proportion downtime.   **[8 M]**

UNIT-III

6. a) Disscuss briefly about the following line balancing terms: **[6 M]**
   i) Precedence constrains
   ii) Minimum Rational Work Elements

   b) A manual assembly line has 17 workstations with one operator per station. Work **[6 M]** content time to assemble the product=28 min. production rate of the line=30 units per hour. The proportion uptime=0.94, and repositioning time=6sec. Determine the balance delay.

(OR)

7. a) A single model assembly line is being planned to produce a consumer appliance **[6 M]** at the rate of 200,000 units per year. The line will be operated 8 hours per shift, two shifts per day, five days per week, 50 weeks per year. Work content time=35 min. For planning purpose, it is anticipated that the proportion uptime on the line will be 95%. Determine (a) average hourly production rate R_p,(b) cycle time T_c, and (c) Theoretical minimum number of work required on the line. (d)if the balance efficiency is 0.93 and the repositioning time=6 sec, how many workers will actually be required?

   b) Assign the work elements to stations following any line balancing algorithm **[6 M]**

Element	T_{ek} (min.)	Immediate predecessors
1	0.4	-
2	0.7	1
3	0.5	1
4	0.8	2
5	1.0	2,3
6	0.2	3
7	0.3	4
8	0.9	4,9
9	0.3	5,6
10	0.5	7,8

UNIT-IV

8. a) What are the five categories of material transport equipment commonly used to **[7 M]** move parts and materials inside a facility?
   b) What is forward sensing in AGVS terminology? **[5 M]**

(OR)

9. a) What features distinguish self-guided vehicles from conventional AGVs? **[6 M]**
   b) What are some of the differences between rail-guided vehicles and automated **[6 M]** guided vehicles?

UNIT-V

10. Write short notes on
    a) Machine Vision **[4 M]**
    b) Concurrent engineering **[4 M]**
    c) Rapid Prototyping **[4 M]**

(OR)

11. a) State the importance of 3D printing **[6 M]**
    b) What are the two basic components of a coordinate measuring machine? **[3 M]**
    c) What are the advantages various business process re-engineering? **[3 M]**

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