AR18

CODE: 18CET420 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August, 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 a short note about the disaster management structure in India.	6M
	b)	Examine various types of man-made disasters and discuss their nature.	6M
		(OR)	
2.		Define disaster management and write a short note on the objectives and principles of disaster management.	12M

UNIT-II

3.		Explain the impact of unpredictable disasters, like chemical and biological, and the precautions people should take to save themselves from its impact.	12M
		(OR)	
4.	a)	Explain the term Tsunami and discuss its impact.	6M
	b)	Explain the term transportation accidents and discuss its impact.	6M

UNIT-III

5.		How disasters impact ecological and economic aspects. Discuss in brief.	12M
		(OR)	
6.	a)	Write a short note on the global and national disaster mitigation strategies.	6M
	b)	Discuss the functions and activities of the National Disaster Management Authority (NDMA).	6M

UNIT-IV

7.		Explain the following: (i) forecasting of disaster (ii) rescue and relief (iii) Rehabilitation and development.	12M
		(OR)	
8.	a)	Discuss the role and responsibilities of state government agencies in disaster management	6M
	b)	Explain the role of early warning system in preparedness stage of disasters	6M

UNIT-V

9.		List and discuss major actions under the rehabilitation phase.	12M
		(OR)	
10.		Briefly outline the damage assessment, awareness, and monitoring strategies.	12M

AR18

CODE: 18EEE461 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-2022

DIGITAL CONTROL SYSTEMS

(Electrical and Electronics 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) What is sampling? Explain different types of sampling operations. 6M
   b) Explain about reconstruction of original signal from sampled signal with the help of a neat sketch. 6M

(OR)

2. Draw the schematic diagram of a basic digital control system and explain the function of every individual block. 12M

UNIT-II

3. a) Obtain the Z-transform of the following functions 6M
   (i) Unit step function (ii) Exponential function
   b) List out various theorems of z-transform. 6M

(OR)

4. a) Find the inverse transform of the function $\frac{4z^2-2z}{z^3-5z^2+8z-4}$ 6M
   b) Solve the differential equation, 6M
   $y(k+2)+3y(k+1)+2y(k)=r(k), r(k)=(1)^k, y(0)=1, y(k)=0, \ for\ k<0$

UNIT-III

5. a) Analyse the stability of the following system using bilinear transformation 6M
   $P(z)=z^3+z^2+2z-2=0$
   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

$P(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$

b) Find whether the discrete time system represented by 6M

$x(k+1) = \begin{bmatrix} -0.5 & 0 \\ 0 & -2 \end{bmatrix} x(k) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(k)$ is controllable or not?

UNIT-IV

7. a) Obtain the state equation and output equation for the system defined by, $\frac{Y(z)}{U(z)} = \frac{z^{-1} + 5z^{-2}}{1 + 4z^{-1} + 3z^{-2}}$ 6M

b) Show that state space representation is non-unique for the given system. 6M

(OR)

8. a) Define the following terms 6M

i) State ii) State variable iii) State vector

b) Determine the state transition matrix for the digital system is described by $x(k+1) = \begin{bmatrix} 0 & 1 \\ -3 & -4 \end{bmatrix} x(k)$ 6M

UNIT-V

9. a) Define state transition matrix and list its properties. 6M

b) Compute the state transition matrix using Z transform method. 6M

(OR)

10. The pulse transfer function of digital control system is given by $G(z) = \frac{5z}{(z^2 + 3z + 2)}$ Obtain a state space representation for the system. Find the complete solution to a unit step input and assume that the initial conditions are zero. 12M

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AR18

CODE: 18MEE462 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-2022

UN CONVENTIONAL MACHINING PROCESSES

(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)	Explain the types of energy sources used in Unconventional Machining Processes.	6 M
	b)	Write about any four UCMP processes.	6 M
		(OR)	
2.	a)	Write the advantages and disadvantages of USM process	6 M
	b)	Explain the various parameters influencing the MRR in USM process.	6 M

UNIT-II

3.	a)	Discuss the major process variables that affect the MRR in Abrasive Jet Machining.	6 M
	b)	What is Abrasive flow finishing process? Explain with a neat sketch.	6 M
		(OR)	
4.	a)	Explain the Abrasive Flow Finishing process.	6 M
	b)	Distinguish between abrasive flow finishing and Magnetic abrasive finishing process.	6 M

UNIT-III

5.	a)	Discuss the classification of Electro Chemical Machining process.	6 M
	b)	Draw a neat sketch of Electro Chemical Machining process scheme and explain.	6 M
		(OR)	
6.	a)	Explain the process of metal removal in Electro Chemical Grinding.	6 M
	b)	List the advantages and disadvantages of chemical machining process.	6 M

UNIT-IV

7.	a)	Explain the selection of different types of electrode materials in EDM process.	6 M
	b)	Discuss the factors to be considered in the selection of di-electric fluid used in EDM.	6 M
		(OR)	
8.	a)	Discuss the applications of Wire EDM process.	6 M
	b)	Explain the Mechanism of Material Removal in EDM process.	6 M

UNIT-V

9.	a)	Explain the advantages and disadvantages of the Electron Beam Machining process.	6 M
	b)	With the help of a neat diagram explain the working of a Laser Beam Machine.	6 M
		(OR)	
10.	a)	Explain the principle of PAM. Discuss the application of plasma for machining.	6 M
	b)	What are the advantages of using a) Dual gas and b) water injected plasma torch?	6 M

AR18

CODE: 18ECE452 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-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 and explain various applications of Satellite Communications.	6 M
	b)	Explain the functions of space segment and ground segment of a satellite system.	6 M
		(OR)	
2.	a)	Explain Brief History of Satellite Communications	6 M
	b)	List and Explain various Frequency band allocations used for satellite services.	6 M

UNIT-II

3.	a)	List and explain in detail on six orbital elements of satellite from Newton's law of motion?	6 M
	b)	Define and explain Kepler's laws.	6 M
		(OR)	
4.	a)	Explain about the Orbital perturbations?	6 M
	b)	Explain about Launching vehicles?	6 M

UNIT-III

5.		Explain in detail on Telemetry, Tracking, Command and Monitoring System.?	12 M
		(OR)	
6.		Explain in detail on Communication subsystem with explanations on Transponder	12 M

UNIT-IV

7.		Explain in detail on TDMA?	12 M
		(OR)	
8.		Derive Link power budget equation from basic transmission theory?	12 M

UNIT-V

9.	a)	What are the various types of antennas used at earth station? Explain anyone with a neat diagram.	6 M
	b)	For a given Low Earth Orbit and Geo-Stationary Satellite Systems, what are the delay and throughput considerations?	6 M
		(OR)	
10.	a)	What are the various types of antennas used at earth station? Explain anyone with a neat diagram.	6 M
	b)	Discuss in detail the delay and throughput considerations of satellite communication link.	6 M

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AR18

CODE: 18ECE451 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-2022

DIGITAL IMAGEPROCESSING

(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 various basic relationships between pixels.	6M
	b)	Explain about image sampling and Quantization.	6M
		(OR)	
2.	a)	Explain about image acquisition.	6M
	b)	Explain the conceptofgraylevels in digital image processing.	6M

UNIT-II

3.	a)	What is the need of image transform? List out various transform used in image processing.	6M
	b)	Explain about discrete cosine transform.	6M
		(OR)	
4.	a)	What is Hadamard transform? Explain in detail and write its properties.	6M
	b)	Find the Haar transformation matrix for N = 8.	6M

UNIT-III

5.	a)	Explain Spatial filtering in Image enhancement.	6M
	b)	Explain image sharpening using Butterworth high pass and Gaussian high pass filters.	6M
		(OR)	
6.	a)	Explain the need for image enhancement.	6M
	b)	Illustrate homomorphic filtering approach for image enhancement.	6M

UNIT-IV

7.	a)	Explain the concept of minimum mean square error filtering.	6M
	b)	What are the different ways to estimate the degradation function? Explain.	6M
		(OR)	
8.	a)	Discuss about RGB colour model.	6M
	b)	What is Pseudocolor image processing? Explain.	6M

UNIT-V

9.	a)	List various approaches in Image segmentation? Explain the methods of region-oriented segmentation.	6M
	b)	Write short notes on line detection algorithms.	6M
		(OR)	
10.	a)	Draw the functional block diagram of image compression system and explain the purpose of each block.	6M
	b)	Explain about any one image compression model.	6M

AR18

CODE: 18CSE464 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-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)	Define human computer interaction. Explain goals of human computer interaction.	6M
	b)	Write about the model of the structure of human memory	6M
		(OR)	
2.	a)	What is meant by good user interface? Discuss its importance	6M
	b)	Illustrate the interface for web user.	6M

UNIT-II

3.	a)	Explain in detail various human aspects that are important and must be considered in designing a good interface	6M
	b)	Explain the Form-filling design guidelines	6M
		(OR)	
4.	a)	Discuss how the physical characteristics of people affect their interaction with systems.	6M
	b)	Why do we produce systems that are inefficient?	6M

UNIT-III

5.	a)	Explain the various strategies for combining multiple Menus.	6M
	b)	What are the application domains that exist for devices with small displays? Explain with examples.	6M
		(OR)	
6.	a)	Why phrasing is necessary in menus? Explain	6M
	b)	Discuss about various types of messages	6M

UNIT-IV

7.	a)	Explain about the components of a Window	6M
	b)	Write about Characteristics of Windows	6M
		(OR)	
8.	a)	Write about Organizing Window Functions.	6M
	b)	List the screen-based controls and explain how to choose proper screen based controls with example	6M

UNIT-V

9.	a)	What is an Icon? Explain different icons in detail.	6M
	b)	Write about Possible Problems with Color	6M
		(OR)	
10.	a)	Explain choosing colors for Statistical Graphics Screens	6M
	b)	Explain how colors are chosen for web pages	6M

AR16

CODE: 16CE4034 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August,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)	What is meant by Episode in Air Pollution? Explain in detail with any one example.	**6M**
	b)	Differentiate between stationary and mobile sources of Air pollutants.	**8M**
		(OR)	
2.	a)	Explain classification of Natural and Artificial Air pollutants.	**7M**
	b)	Explain in detail about Line and Areal classification of Air pollutants.	**7M**

UNIT-II

3.	a)	Explain in detail effects of Air pollutants on materials.	**7M**
	b)	Define Acid Rains. Explain causes and effects of Acid rains in detail.	**7M**
		(OR)	
4.	a)	Explain Economical effects of Air pollution in detail.	**7M**
	b)	What is meant by Ozone Holes? Explain effects and control measures in detail.	**7M**

UNIT-III

5.	a)	What are the various instruments used for the Flue gases Stack Monitoring? Explain in detail.	**7M**
	b)	Write Indian Air Emission Standards in Ecologically sensitive areas.	**7M**
		(OR)	
6.	a)	Explain in detail how stack monitoring is conducted.	**7M**
	b)	Explain importance of Ambient Air Quality monitoring for a city.	**7M**

UNIT-IV

7.	a)	Explain in detail about Control of particulate pollutants at Sources.	**6M**
	b)	Explain about various types of Scrubbers with neat sketch.	**8M**
		(OR)	
8.	a)	Explain about Gravity settling chamber with neat sketch.	**7M**
	b)	Explain Design and operation of Reverse Flow Cyclones in detail.	**7M**

UNIT-V

9.	a)	How do you control the emission of NOx by various absorption methods? Explain in detail	**7M**
	b)	Explain various dry methods of removal and recycling of SO2 and NO2	**7M**
		(OR)	
10.	a)	How do you control the emission of SO_2 by various adsorption methods? Explain in detail	**7M**
	b)	Explain how we can control gaseous pollutants by method of process changes.	**7M**

AR16

CODE: 16ME4039 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August, 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)	Explain in detail various kinds of renewable energy sources and their potential and discuss the solar energy option.	7M
	b)	What is the basic principle of wind energy conversion? Explain with neat sketch horizontal axis wind Turbine.	7M
		(OR)	
2.	a)	What is a fuel cell ? Describe the working principle of hydrogen fuel cell	7M
	b)	Write short notes on MHD generator.	7M

UNIT-II

3.	a)	Draw the general lay out of a thermal power plant and explain the working of different circuits	7M
	b)	Explain the working of mechanical ash handling system with a neat sketch.	7M
		(OR)	
4.	a)	Explain the principle of fluidized bed combustion with a neat sketch.	7M
	b)	Explain the working of electrostatic precipitator with a neat sketch.	7M

UNIT-III

5.	a)	Name and explain briefly the various fuel injection systems in diesel power plant.	7M
	b)	Discuss with a simple sketch, thermostat cooling system in Diesel power plant.	7M
		(OR)	
6.	a)	Explain with neat sketches any two types of supercharging methods of diesel engines.	7M
	b)	Explain the working of a closed cycle gas turbine with a neat sketch.	7M

UNIT-IV

7.	a)	Discuss the various factors for selecting a site for hydro electric power plant	7M
	b)	Explain the working of a pumped storage power plant with a neat diagram	7M
		(OR)	
8.	a)	Explain with a line diagram, the working of homogeneous reactor.	7M
	b)	Sketch and explain gas cooled reactor and also its advantages	7M

UNIT-V

9.	a)	Estimate the generating cost per unit supplied from a power plant having the following data. Plant capacity = 120 MW. Capital cost = Rs. 600 x 10^6 Annual load factor = 40% Annual cost of fuel, taxation, oil and salaries = Rs 6,00,000 Interest and depreciation = 10%	7M
	b)	Explain the construction of a load curve and give its significance.	7M
		(OR)	
10.	a)	Define peak load, demand factor, load factor and plant use factor.	7M
	b)	The following data is given for a steam power plant: Maximum Demand 25,000 kW; Load factor 40%; Coal consumption 0.86 kg/kWh; Boiler efficiency 85%; Turbine efficiency 90%; Price of coal Rs. 55 per Ton; Determine: (i) Thermal efficiency of the station (ii) Coal bill of the station for one year.	7M

AR16

CODE: 16EC4036 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, August-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.	7M
	b)	Derive the radar equation and shows the significance of each term in that equation	7M
		(OR)	
2.	a)	Elaborate unambiguous range, second time around echo, minimum detectable signal, radar range, pulse repetition frequency.	7M
	b)	Describe the principle of integration of pulses and explain its significance.	7M

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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