AR20

CODE: 20AIT302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

Machine Learning using Python

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the concepts of accuracy, precision, recall, and F1-score. When would you use one metric over the others?	6	1	2
	b)	Explain the main steps involved in supervised learning	4	1	2
		(OR)			
2.	a)	Describe the basic principles of Naïve Bayes classification. When is Naïve Bayes particularly useful?	5	1	2
	b)	What is the exploration-exploitation trade-off in reinforcement learning, and how is it managed?	5	1	1
		UNIT-II			
3.	a)	Explain the fundamental concept of clustering in unsupervised learning. How does it differ from other unsupervised learning techniques, and why is it important in data analysis?	5	2	2
	b)	List and define three common internal evaluation metrics used to assess the quality of clustering results. Provide a brief explanation of each metric's purpose.	5	2	1
		(OR)			
4.	a)	Evaluate the BIRCH and CURE clustering algorithms in terms of their suitability for handling large datasets. Discuss the key principles behind each algorithm and how they address scalability issues.	5	2	5
	b)	Apply the Davies-Bouldin index to evaluate the quality of two different clustering solutions. Interpret the index values and discuss which clustering solution is superior based on the results.	5	2	3
		UNIT-III			
5.	a)	Analyse the benefits and limitations of feature selection in the context of improving model interpretability and reducing overfitting. Provide real-world examples where feature selection could have a significant impact on model performance.	5	3	4
	b)	Discuss the advantages and disadvantages of recursive feature elimination (RFE) as a wrapper method.	5	3	6
		(OR)			
6.	a)	Provide an overview of Principal Component Analysis (PCA) as a feature projection technique. What problem does it solve, and how is it applied?	5	3	2
	b)	Explain how to use cross-validation to evaluate the effectiveness of feature selection or dimensionality reduction techniques.	5	3	2

UNIT-IV

7.	a)	What is a Support Vector Machine (SVM), and what is its primary objective in machine learning? How does it differ from traditional linear classifiers?	5	4	1
	b)	Discuss the regularization parameter (C) in SVM. How does it influence the balance between maximizing the margin and minimizing classification errors? Provide insights into choosing an appropriate value for C.	5	4	6

(OR)

8.	a)	Explain the concept of linear learning machines. How do they work, and what are their limitations when dealing with non-linear data?	5	4	2
	b)	Provide a step-by-step explanation of the training process in SVM for a binary classification problem using a linear kernel. Include how support vectors are identified, and the decision boundary is determined.	5	4	2

UNIT-V

9.		Discuss how Lasso, Ridge, and Elastic Net regularization methods can be applied to multiple linear regression models. Explain the role of each regularization technique in improving model performance and handling multicollinearity.	10	5	6

(OR)

10.	a)	Explain the key differences between simple linear regression and multiple linear regression. When would you choose to use multiple linear regression in data analysis?	5	5	2
	b)	Define the coefficient of determination (R-squared) in regression analysis. How is it calculated, and what does an R-squared value close to 1 or 0 indicate about the goodness of fit?	5	5	1

UNIT-VI

11.	a)	Discuss the challenges of training RNNs, including vanishing and exploding gradients. How can techniques like LSTM (Long Short-Term Memory) and GRU (Gated Recurrent Unit) address these issues?	5	6	6
	b)	Describe the delta learning rule for a single perceptron. How does it update weights to minimize the error in classification? How can this rule be extended to train multi-perceptron layers in a neural network?	5	6	2

(OR)

12.	a)	Discuss the generalized delta learning rule for training multi-layer feed-forward neural networks. What are the key components of this rule, and how does it handle error propagation through multiple layers?	5	6	6
	b)	Explain the back-propagation algorithm for training neural networks. How does it compute gradients and update weights to minimize the error in the network's output? What are some common activation functions used in this context?	5	6	2

AR20

CODE: 20DSI302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

Data Handling and Visualization

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.		What is Coordinate System? Explain different Coordinate system and axis used in data visualization	10	1	1,2
		(OR)			
2.		Outline different use cases for color in data visualization with examples.	10	1	2
		UNIT-II			
3.	a)	Identify the limitation of bar plots and give an examples to visualize the data using dots and heat maps.	5	2	3
	b)	Explain about Quantile–quantile (q-q) plots with an example.	5	2	2
		(OR)			
4.		Describe different approaches to visualizing many distributions at once.	10	2	1
		UNIT-III			
5.		Illustrate the different scenarios to visualizing proportions	10	3	2
		(OR)			
6.	a)	Explain about visualization of data using nested pies with an example.	5	3	2
	b)	Identify the problem of side-by-side bars and stacked bars and how can you resolve this issue.	5	3	3
		UNIT-IV			
7.		Illustrate visualizing associations among two or more quantitative variables using scatter plots and Correlograms	10	4	2
		(OR)			
8.		Explain visualizing time series data of an independent variable.	10	4	2
		UNIT-V			
9.	a)	Explain about smoothing and Identify the limitations of smoothing	5	5	2
	b)	Define Datum. Visualize Geospatial Data in Choropleth mapping and Layers	5	5	1
		(OR)			
10.		Discuss how to visualize uncertainty by Frequency Framing and Curve Fits	10	5	1
		UNIT-VI			
11.		Explain visualizations of data along a Linear axis and logarithmic axes.	10	6	2
		(OR)			
12.		Outline different approaches of handling overlapping points.	10	6	2

AR20

CODE: 20EVT302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

SPECIAL ELECTRICAL MACHINES

(ELECTRICAL AND ELECRONICS 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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Define step angle. Explain the operation of a variable reluctance stepper motor.	5	1	Understanding
	b)	With a block diagram, explain the closed loop control of a stepper motor.	5	1	Analysing
		(OR)			
2.	a)	With neat diagrams, explain in detail the constructional details of a stepper motor.	5	1	Understanding
	b)	Compare between open loop control and closed loop control of stepper motors.	5	1	Analysing
		UNIT-II			
3.	a)	Draw the constructional details of an SRM and explain its operating principle.	5	2	Understanding
	b)	Explain the power converter controller by the SRM. Also list various applications of SRM.	5	2	Analysing
		(OR)			
4.	a)	What is the need for Hall-effect sensor in SRM control? Explain.	5	2	Understanding
	b)	Explain the torque production mechanism in SR motors. Also derive the expression for torque produced in SR motors.	5	2	Analysing
		UNIT-III			
5.	a)	With the help of model waveforms for back emf, gate pulses of converter, stator currents and voltages, explain the operation of a BLDC motor.	5	3	Remembering
	b)	Compare between sensorless control and sensor based control of BLDC motors.	5	3	Understanding
		(OR)			
6.	a)	With a block diagram, explain the sensorless control of BLDC motor.	5	3	Understanding
	b)	What is the need for sensors in the control of BLDC motors? Explain	5	3	Analysing
		UNIT-IV			
7.	a)	What are linear motors? Explain different types and applications of linear motors.	5	4	Remembering
	b)	Explain the construction of a Linear Induction motor.	5	4	Analysing
		(OR)			
8.	a)	Explain the principle of operation of linear induction motor.	5	4	Understanding
	b)	List and compare different types of motors employed in traction.	5	4	Analysing

UNIT-V

9.	a)	Explain the sensorless control of PMBLDC motor with the help of a neat circuit.	5	5	Understanding
	b)	Compare between PMBLDC motors and PMSM motors.	5	5	Analysing
		(OR)			
10.	a)	Compare the performance characteristics of DC motors with PMDC motors.	5	5	Understanding
	b)	Discuss the principle of operation of permanent magnet DC motors. Also mention their applications.	5	5	Analysing

UNIT-VI

11.	a)	What is the selection criterion of motors for electric traction application. Explain.	5	6	Remembering
	b)	Discuss the role and potential for linear motors in traction systems.	5	6	Analysing
		(OR)			
12.	a)	Compare between AC drives and DC drives for traction application.	5	6	Understanding
	b)	Explain how the single sided linear induction motor is used for traction drive applications.	5	6	Analysing

AR20

CODE: 20IOT302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

Sensor Technologies in IoT

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Discuss the classification of sensors	5	Co1	Understand
	b)	Discuss about the transfer function	5	CO1	Understand
		(OR)			
2.	a)	List three common classifications of sensors used in IoT applications.	3	CO1	Remember
	b)	Describe the transfer function of a sensor and its role in converting physical measurements to electrical signals in IoT devices.	7	CO1	Understand
		UNIT-II			
3.	a)	Discuss the operating principle of a potentiometric sensor.	5	C02	Understand
	b)	Discuss how capacitive sensors work and provide an example of an application where they are used for measuring displacement.	5	C02	Understand
		(OR)			
4.	a)	Design a simple experiment to demonstrate the functioning of an optical sensor for position measurement.	7	C02	Design
	b)	Compare the advantages and disadvantages of LVDT and Hall effect sensors for position sensing in industrial automation.	3	CO2	Analyze
		UNIT-III			
5.	a)	Discuss the working principle of thermal accelerometers and provide examples of scenarios where they might be preferred over other accelerometer types.	5	CO3	Understand
	b)	Discuss the challenges and limitations associated with thermal accelerometers, especially in harsh environments.	5	CO3	Understand
		(OR)			
6.	a)	Compare the sensitivity and frequency response of piezoelectric accelerometers to capacitive accelerometers	5	CO3	Analyze
	b)	Discuss operating principle of piezoelectric accelerometers, and why are they commonly used in high-frequency vibration measurement applications?	5	CO3	Analyze
		UNIT-IV			
7.	a)	Provide examples of areas where pressure sensors play a crucial role in ensuring safety and efficiency.	5	CO4	Understand
	b)	Discuss the fundamental concept of pressure and how it is typically measured using sensors.	5	CO4	Understand
		(OR)			
8.	a)	Discuss the factors that influence the sensitivity and response time of pressure sensors employing bellows or membranes.	5	CO4	Understand
	b)	Compare the performance characteristics of piezoresistive sensors with other types of pressure sensors.	5	CO4	Analyze

UNIT-V

9.	a)	Discuss the fundamental principles of fluid flow dynamics, and how do they relate to the operation of flow sensors?	5	CO5	Understand
	b)	Describe the working principle of thermal transport sensors for measuring fluid flow. What are their advantages and limitations compared to other flow sensing methods?	5	CO5	Understand
		(OR)			
10.	a)	Discuss how the ultrasonic sensors utilize sound waves to measure fluid flow, and what are the key advantages of this method?	5	CO5	Understand
	b)	Discuss the factors that can influence the accuracy and precision of ultrasonic flow sensors in practical applications.	5	CO5	Understand

UNIT-VI

11.	a)	Discuss the operating principle of thermo-resistive sensors and provide examples of applications where they are commonly used.	5	CO6	Understand
	b)	Compare the characteristics and advantages of resistance temperature detectors (RTDs) and thermistors for temperature sensing.	5	CO6	Analyze
		(OR)			
12.	a)	Define the concept of humidity and its different measurement units. How is humidity important in various fields?	5	CO6	Understand
	b)	Discuss the basic functioning of electrical conductivity sensors for humidity measurement and discuss their strengths and weaknesses.	5	CO6	Understand

AR20

CODE: 20ROI302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

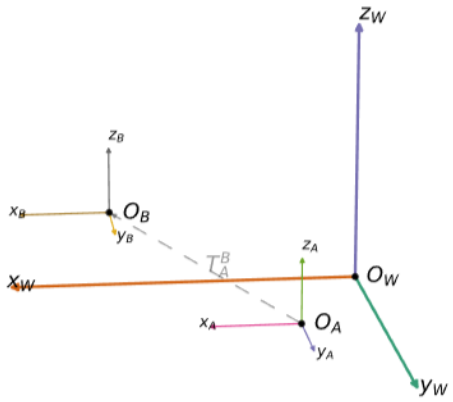
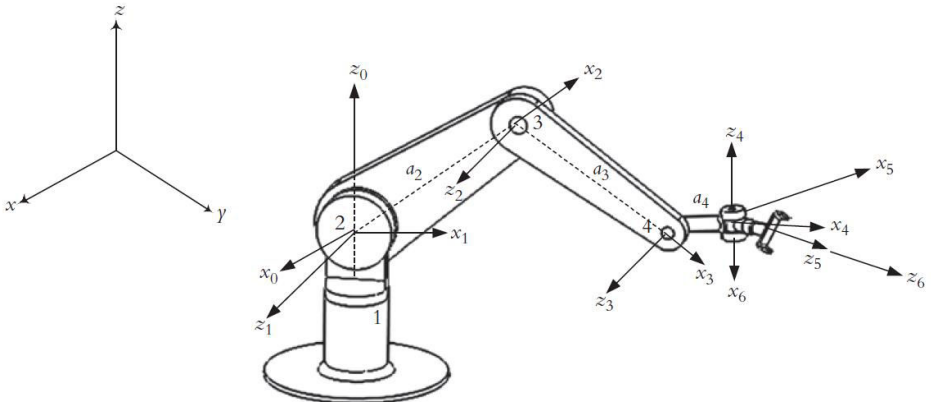
III B.Tech I Semester Regular/Supplementary Examinations, October-2023

KINEMATICS AND DYNAMICS OF ROBOT MANIPULATOR

(MECHANICAL ENGINEERING)

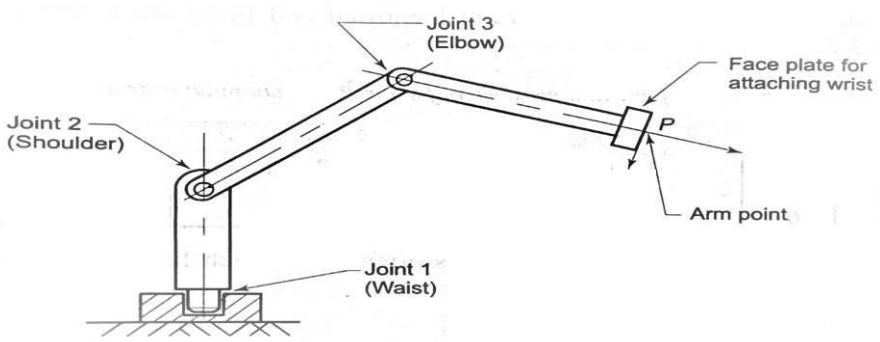
Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.		The figure shows that frame O is rotated related to frame O about X by 60^0 Clockwise, translated 20 units along Y_A and 15 units along Z_A. Find ${}^B_A T$. The frame defining O is $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0.5 & 0.866 & 20 \\ 0 & -0.866 & 0.5 & 15 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ 	10	1	Applying
		(OR)			
2		Explain XYX Euler angles.	10	1	Understanding
		UNIT-II			
3.		For the simple 6-DOF robot shown in figure, assign the necessary coordinate frames based on the D-H representation, fill out the accompanying parameters table, and derive the forward kinematic equation of the robot 	10	2	Applying
		(OR)			
4.	a)	Two points $a_{uvw} = (4,3,2)^T$ and $b_{uvw}=(6,2,4)^T$ with respect to the rotated OUVW coordinate system, determine the corresponding points a_{xyz}, b_{xyz} with respect to the reference coordinate system if it has been rotated 60^0 about the OZ axis	6	2	Applying
	b)	Derive Homogeneous transformation matrix for a Cartesian Robot	4		

UNIT-III

5.	Formulate the forward kinematic model of three-degree of freedom (RPP) manipulator as shown in figure.	10	3	Applying



(OR)

6.	The positions and restored orientation of a cylindrical robot are given. Find the matrix representing the original position and orientation of the robot before it was restored. T= $\begin{bmatrix} 0.5 & 0 & -0.5 & 7 \\ 0 & 1 & 0 & 4 \\ 0.5 & 0 & 0.5 & 4 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	10	3	Applying

UNIT-IV

7.	The trajectory of a particular joint is specified as follows: Path points in degrees: 10, 35, 25, 10. The duration of these three segments should be 2, 1, 3 seconds, respectively. The magnitude of the default acceleration to use at all blend points is 50 degrees/second^2. Calculate all segment velocities, blend times, and linear times.	10	4	Applying

(OR)

8.	Explain about Third-Order Polynomial Trajectory Planning in joint space Trajectory planning	10	4	Understanding

UNIT-V

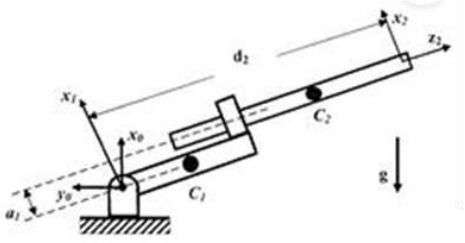
9.	a)	A frame B has translated a differential amount of Trans(0:05; 0:02; 0:02) units. Find its new location and orientation B= $\begin{bmatrix} 0.5 & 0 & -0.5 & 7 \\ 0 & 1 & 0 & 4 \\ 0.5 & 0 & 0.5 & 4 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	5	5	Applying
	b)	Write the differential operator matrix for the following differential transformations: d_x= 0:02; d_y=0:05; d_z=0:03 units and d_x=0:08; d_y= 0:02; d_z= 0:09 radians	5	5	Applying

(OR)

10.	Calculate the Jacobian matrix for the differential motions of a robot and its hand frame	10	5	Understanding

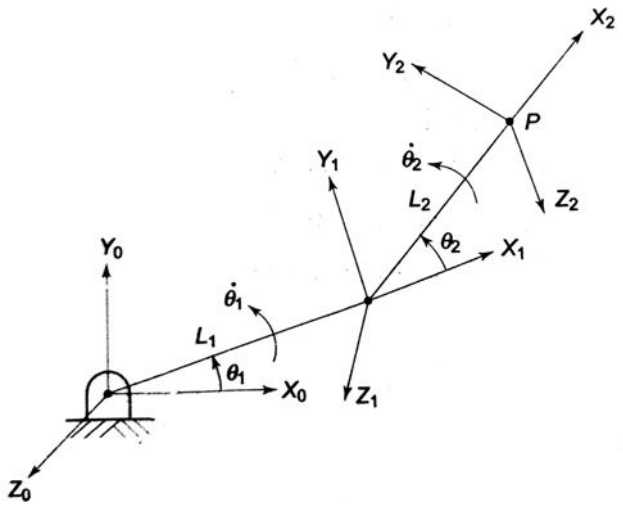
UNIT-VI

11.	The links of an RP manipulator, shown in Figure have inertia tensors $C_{1_{I_1}} = \begin{bmatrix} I_{xx1} & 0 & 0 \\ 0 & I_{yy1} & 0 \\ 0 & 0 & I_{zz1} \end{bmatrix}$; $C_{2_{I_2}} = \begin{bmatrix} I_{xx2} & 0 & 0 \\ 0 & I_{yy2} & 0 \\ 0 & 0 & I_{zz2} \end{bmatrix}$	10	6	Applying



(OR)

12.	Discuss about Newton – Euler formulations for2DOFRR- planar manipulator arm.	10	6	Understanding



AR20

CODE: 20SCT302 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

SMART ENERGY & TRANSPORTATION SYSTEMS

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the key elements of a smart energy management system. And how do these elements work together to optimize energy usage.	5	1	Understand
	b)	Define net-zero energy buildings and energy-plus buildings. And what are the key strategies and technologies used to achieve these energy performance goals in construction.	5	1	Remember
		(OR)			
2.	a)	Identify the major challenges in transforming cities into smart energy ecosystems. And how can these challenges be addressed effectively.	5	1	Understand
	b)	Discuss the utilization of renewable energy sources in smart energy systems. And what are the advantages and challenges associated with integrating renewable into urban energy management?	5	1	Understand
		UNIT-II			
3.	a)	Provide an overview of solar energy conversion technologies. And how do these technologies capture and convert sunlight into usable energy.	5	2	Understand
	b)	Explain the role of solar street lights in urban areas. What are the advantages of using solar powered lighting systems?	5	2	Understand
		(OR)			
4.	a)	Discuss the advantages and limitations of solar PV systems for large-scale energy production in urban environments.	5	2	Understand
	b)	Discuss the potential challenges and solutions related to the installation and maintenance of rooftop solar systems in densely populated urban environments.	5	2	Understand
		UNIT-III			
5.	a)	Explain the concept of demand management through smart grids. And what strategies and technologies are used to optimize energy consumption in real-time.	5	3	Understand
	b)	Discuss the role of advanced metering infrastructure (AMI) in demand management and data collection for smart grids. How does it benefit both utilities and consumers.	5	3	Understand
		(OR)			
6.	a)	Discuss the importance of standardized charging connectors and protocols for EVs. And how do these standards ensure interoperability and consumer convenience.	5	3	Remember
	b)	Explain the need of electrical vehicles and what are the new regulations and consumer awareness in adopting electric vehicles.	5	3	Understand

UNIT-IV

7.	a)	Discuss the key objectives of an urban smart transport system. And how do these objectives align with sustainability, efficiency, and improved quality of life in cities.	5	4	Understand
	b)	Explore various strategies employed in smart transport systems to reduce traffic congestion and enhance mobility. And how can these strategies contribute to reduced pollution and improved air quality.	5	4	Understand
		(OR)			
8.	a)	Discuss the concept of non-motorized transport (NMT) and its role in creating more sustainable and livable urban environments. What are the benefits and challenges associated with NMT?	5	4	Understand
	b)	Describe how smart transport systems can reduce greenhouse gas emissions and promote eco-friendly transportation alternatives.	5	4	Understand

UNIT-V

9.	a)	Explain the role of Information and Communication Technology (ICT) in supporting smart transport systems? And how does ICT enhance the efficiency and sustainability of urban transportation?	5	5	Understand
	b)	Discuss the significance of real-time traffic information systems (RTIS) in urban transport.	5	5	Apply
		(OR)			
10.		Describe the key features and benefits of an automated fare collection system in public transportation.	10	5	Apply

UNIT-VI

11.	a)	Explore case studies that exemplify the synergies between smart energy and transport systems. And how can an integrated approach lead to greater efficiency and sustainability in urban areas?	5	6	Understand
	b)	Discuss how international and national case studies in smart energy and transport systems contribute to global efforts in combating climate change and achieving sustainable development goals.	5	6	Understand
		(OR)			
12.	a)	Analyze a national-level initiative that promotes the use of electric vehicles (EVs) and renewable energy sources in the transportation sector.	5	6	Analysis
	b)	Discuss the role of government incentives and regulatory frameworks in the success of national smart energy and transport projects.	5	6	Understand

AR16

CODE: 16OE3032 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B. Tech I Semester Supplementary Examinations, October,2023

ENVIRONMENTAL IMPACT ASSESSMENT

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 EIS and Interpret the need of environmental base maps for assessment and evaluation of a project site along with their significance. 7M
   b) Compare and contrast the terms EIA and IEE. 7M

(OR)

2. a) Check the need for public participation during the assessment and evaluation of a project activity in an area and justify how do you support them. 6M
   b) Characterize what is seasonal EIA and list the eight principles which guide the EIA process. 8M

UNIT-II

3. a) Describe how do you evaluate a road project using Cost/Benefit analysis tool. 7M
   b) Determine what criteria's did require for the selection of concerned EIA method. 7M

(OR)

4. a) Apply simple interaction matrix method and assess environmental parameters of a paper and pulp mill. 8M
   b) State various merits and drawbacks with an Ad-hoc method. 6M

UNIT-III

5. a) Determine what are the 10 evaluation parameters required for the assessment of ecosystems. 8M
   b) Interpret the alternate remedies that are to be considered during assessment of fauna with respect to a major highway project. 6M

(OR)

6. a) Determine what kind of evaluation parameters required for the assessment of flora. 8M
   b) List and describe any 10 important environmental and social impacts which will arise during land clearing activities. 6M

UNIT-IV

7. a) Characterize what is environmental compliance audit and interpret the stages involved during conducting on-site environmental audit. 7M
   b) Determine and prioritise the parameters to be audited at on-site while visiting a chemical industry. 7M

(OR)

8. a) State the three audit objectives and determine the need to prepare the audit plan of action before conducting audit. 6M
   b) Prepare an environmental audit report to a thermal power plant. 8M

UNIT-V

9. a) State the detailed functions of state pollution control boards with respect to air pollution control. 6M
   b) Prepare an EIS draft report to a mining project for final hearing. 8M

(OR)

10. a) List the objectives and provisions stated under M V Act-1988 of India. 8M
    b) Describe any 6 provisions provided under EPA-1986. 6M

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AR16

CODE: 16OE3033 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B. Tech I Semester Supplementary Examinations, October, 2023

ENERGY AUDIT CONSERVATION AND 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. List different types of energy audit 14 M

(OR)

2. a) Define Energy Audit, Energy Index, Cost Index And Load Profiles. 8 M
   b) Explain the representation of energy conservation schemes. 6 M

UNIT-II

3. Discuss Principles for Effective Energy Management. 14 M

(OR)

4. a) Describe organization of energy management program. 10 M
   b) Explain Monitoring of Energy Management. 4 M

UNIT-III

5. a) Illustrate the voltage variation, voltage unbalance and over motoring. 9 M
   b) Explain about electrical motor energy audit. 5 M

(OR)

6. Find different loss in electrical motors. 14 M

UNIT-IV

7. a) Define Power factor, identify the location of capacitors. 7 M
   b) Outline about Good lighting system design and practice. 7 M

(OR)

8. a) Explain about Energy Instruments. 7 M
   b) Define Power factor, classify the methods of improvement. 7 M

UNIT-V

9. a) What is Economic analysis? 7 M
   b) What is replacement analysis? 7 M

(OR)

10. Explain different Depreciation Methods. 14 M

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AR18

CODE: 18IET321 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B. Tech I Semester Supplementary Examinations, October,2023

Fundamentals of Fuzzy Logic

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. Let **A** be the fuzzy set of below average students, B be a fuzzy set of average students and C be a fuzzy set of above average students defined as 12M
$A = \{(x_1,0.6),(x_2,0.5),(x_3,0.3),(x_4,0.2)\}$, $B = \{(x_1,0.5),(x_2,0.8),(x_3,1),(x_4,0.6)\}$, $C = \{(x_1,0.6),(x_2,0.8),(x_3,0.9),(x_4,1)\}$. Find $(i)(A \cup B)$
$(ii)(A \cap B) \cap C$ $(iii)(A \cap B)^c$ (iv) $A^c \cap B^c$ $(v)A^c \cup B^c$ $(vi)(A\,UB)^c$

(OR)

2. Let $X = \{1,3,5\}$, Let R and S be the relations given by R = $\begin{matrix} & 1 & 3 & 5 \\ 1 & 0 & 1 & 0 \\ 3 & 0 & 0 & 1 \\ 5 & 0 & 0 & 0 \end{matrix}$ and S 12M
$= \begin{matrix} & 1 & 3 & 5 \\ 1 & 0 & 1 & 1 \\ 3 & 0 & 0 & 1 \\ 5 & 0 & 0 & 0 \end{matrix}$ then $(i)R \circ S$ $by\ max - \min\ composition$ (ii)$R \cup S$,
$(iii)R \cap S$ $(iv)R^c$ $(v)\,S^c$ $(vi)R^c \cap S^c$.

UNIT-II

3. Let X= $\{x_1,x_2,x_3\}$, $Y = \{y_1,y_2\}$ be the universal sets, 12M
$A = \left\{\frac{0.6}{x_1},\frac{0.9}{x_2},\frac{1}{x_3}\right\}$, $B = \left\{\frac{0.6}{y_1},\frac{1}{y_2}\right\}$, $B' = \left\{\frac{0.5}{x_1},\frac{0.9}{x_2},\frac{1}{x_3}\right\}$ be the fuzzy sets. Suppose we have fuzzy propositions, Rule P: If x is A then y is B , Fact Q: y is B' then estimate A' using generalized Modus Tollens rule.

(OR)

4. For the universe $X = \{-5,5\}$, two fuzzy sets are defined as 12M
$A = \text{Zero} = \left\{\frac{0}{-2},\frac{0.5}{-1},\frac{1}{0},\frac{0.5}{1},\frac{0}{2}\right\}$, $B = \text{positive medium} = \left\{\frac{0}{0},\frac{0.6}{1},\frac{1}{2},\frac{0.6}{3},\frac{0}{4}\right\}$. (1).Construct the relation for the rule "if A then B" (2). If we introduce new antecedent $A' = "Positive\ small" = \{\frac{0}{-2},\frac{0.1}{-1},\frac{0.3}{0},\frac{0.6}{1},\frac{1}{2}\}$ then using Rule P: If x is A then y is B , Fact Q: x is A' then estimate B' using generalized Modus Ponens rule

UNIT-III

5. Construct a fuzzy set using "Lagranges Interpolation" method for the following data: 12M
$\{(0,0),(0.5,0.2),(0.8,0.9),(1,1),(1.2,0.9),(1.5,0.2),(2,0)\}$.

(OR)

6. Explain the method of construction of fuzzy set. Give an example. 12M

UNIT-IV

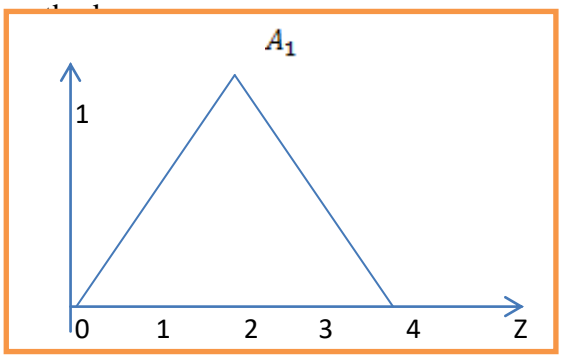
7. Explain Fuzzy Controllers with diagram and give an example. 12M

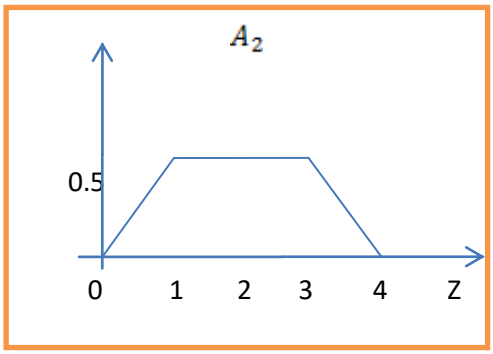
(OR)

8. Design a fuzzy controller to determine the wash time of domestic washing machine, assume that the input variables are dirt and grease on the cloth, use 3 linguistic variables for each of the input variable as for Dirt: Small Dirt(SD), Medium Dirt(MD), Large Dirt(LD) and for Grease: Small Grease (SG), Medium Grease (MG), Large Grease (LG). Assume the output variable be the wash time, and use 5 linguistic variables as Very Small wash time(VST), Small wash time(ST),Medium wash time (MT),Large wash time(LT), Very Large wash time(VLT). Find the **wash time** if dirt and grease levels are 60 and 70 respectively. 12M

UNIT-V

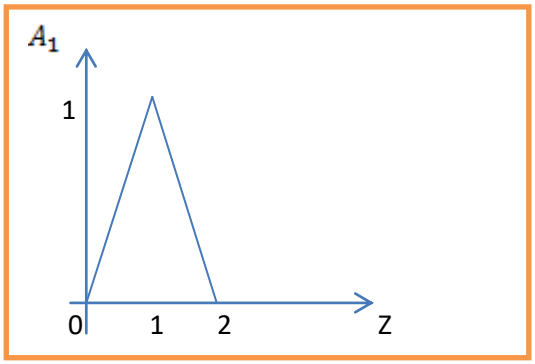
9. For the two fuzzy sets A_1& A_2 as shown below, Calculate the defuzzified avalue of Z^* using (i) Centroid Method (ii)Center of Sums method (iii) Mean of Maxima 12M

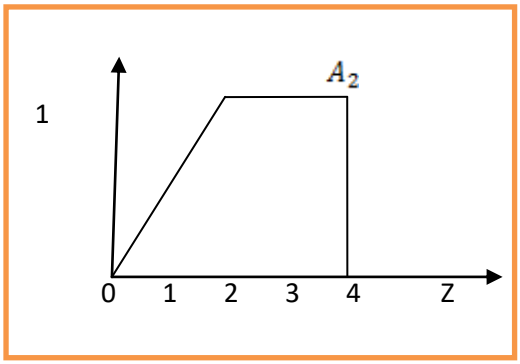




(OR)

10. For the two fuzzy sets A_1& A_2 as shown below, Calculate the defuzzified avalue of Z^* using **(i)** Centroid Method (ii) Center of Sums method (iii) Mean of Maxima method. 12M





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AR18(RA)

CODE: 18IET323 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B. Tech I Semester Regular(RA)/Supplementary Examinations, October, 2023

REMOTE SENSING

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 briefly about the process of Remote Sensing with a neat supporting diagram. 6M
   b) What is meant by electromagnetic radiation and explain basic wave theory with a neat sketch? 6M

(OR)

2. How would you explain with a neat sketch about the various wavelengths regions of Electro Magnetic Spectrum? 12M

UNIT-II

3. What is meant by space-born platforms. Illustrate about the orbit characteristics of space born platforms? 12M

(OR)

4. a) How would you explain about air-born remote sensing platform with figures? 6M
   b) Classify the remote sensing satellite orbits and explain the characteristics of Sun synchronous orbit satellites with figure. 6M

UNIT-III

5. What is meant by active sensors? Discuss about characteristics of Laser Scanner, Radar Altimeter, and Imaging Radar? 12M

(OR)

6. List the passive sensors and explain any three of passive remote sensing sensors and their applications. 12M

UNIT-IV

7. Explain about elements of visual image interpretation quoting suitable examples for each. 12M

(OR)

8. a) Explain briefly about filtering concept in image enhancement with figures? 6M
   b) List the various non-linear contrast stretching methods and explain the method of Histogram-equalized stretch with figures? 6M

UNIT-V

9. a) Explain the terms Image space and feature space in image classification with figures 6M
   b) List and explain about five steps of image classification process 6M

(OR)

10. Explain with schematic diagram about stages of supervised image classification procedure? 12M

AR18

CODE: 18IET325 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October, 2023

PRINCIPLES OF MECHANICAL MEASUREMENTS

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. What are the different static and dynamic performance characteristics used in mechanical measurements? **12M**

(OR)

2. What do you mean by instrumentation? Write the objectives of instrumentation? **12M**

UNIT-II

3. Explain how an elastic diaphragm gauge is used to measure pressure with the help of relevant sketch. **12M**

(OR)

4. Explain the principle of operations of **12M**
(I) Hot wire anemometer.
(II) Turbine meter for the measurement of Fluid velocity.

UNIT-III

5. What is pyrometer? Briefly explain the working of optical pyrometer with Suitable sketches. **12M**

(OR)

6. Explain working of liquid filled thermometer with relevant sketches? **12M**

UNIT-IV

7. Explain the different principles of working of capacitive transducers. **12M**

(OR)

8. What is potentiometer? How it measures linear and angular displacements? **12M**

UNIT-V

9. Working and construction of load cells and how it measure force? **12M**

(OR)

10. Describe the function of a stroboscope and explain how speed of a rotating shaft. **12M**