

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

**III B. Tech II Semester Regular Examinations, April, 2025**

**Advance Machine Learning  
(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

	<u><b>UNIT-I</b></u>	Marks	CO	Blooms Level
1. a)	What are voting classifiers and explain how they work?	7	CO1	L3
b)	Explain about out-of-bagging evaluation.	3	CO1	L2
	<b>(OR)</b>			
2. a)	Explain about Random Patches and Random Subspaces	3	CO1	L2
b)	Explain briefly about Random Forest algorithm?	7	CO1	L4
	<u><b>UNIT-II</b></u>			
3. a)	Explain working principle of adaptive boosting algorithm?	8	CO2	L2
b)	What is BootStrap Aggregating in ensemble learning?	2	CO2	L3
	<b>(OR)</b>			
4. a)	Explain in detail about Stacking method?	7	CO2	L2
b)	What is AdaBoost R2?	3	CO2	L3
	<u><b>UNIT-III</b></u>			
5. a)	Explain about Markov Random Field algorithm?	6	CO3	L2
b)	Differentiate between Contrastive Divergence algorithm and Restricted Boltzmann machine algorithm?	4	CO3	L4
	<b>(OR)</b>			
6. a)	Explain about Hidden Markov Models?	7	CO3	L2
b)	Explain how Boltzmann Distribution works in Markov Random Field?	3	CO3	L1
	<u><b>UNIT-IV</b></u>			
7. a)	Explain about Droupout with example?	8	CO4	L2
b)	What is Baye's Theorm?	2	CO4	L3
	<b>(OR)</b>			
8. a)	Explain about L2 regularization?	7	CO4	L2
b)	Differentiate between Lasso and ridge regularization.	3	CO4	L4
	<u><b>UNIT-V</b></u>			
9. a)	Explain about ARIMA models?	5	CO5	L2
b)	Differentiate between Cyclical and Seasonal analysis.	5	CO5	L4
	<b>(OR)</b>			
10. a)	What is Forecasting timeseries and explain how is it used in financial Markets?	6	CO5	L3
b)	What is Auto-Correlation and mention it's types.	4	CO5	L4
	<u><b>UNIT-VI</b></u>			
11. a)	Explain about Neural Machine Translation?	8	CO6	L2
b)	Define Attention Mechanisms in Natural Language Processing?	2	CO6	L1
	<b>(OR)</b>			
12. a)	Explain How Text Summarization works in NLP?	6	CO6	L2
b)	Differenciate between information Extraction and Information Retrieval?	4	CO6	L4

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			Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>					
1.	a	Define information security? Explain Current Trends in information Security?	5	CO-1	K1
	b	Discuss about Basics Principles of Confidentiality, Integrity. Availability Concepts	5	CO-1	K2
<b>(OR)</b>					
2.	a	Explain about Administrative Measures and Technical Measures of information security	5	CO-1	K1
	b	Explain briefly about ITACT2000?	5	CO-1	K2
<b><u>UNIT-II</u></b>					
3.	a	Briefly explain Risk Assessment Framework OCTAVE?	5	CO-2	K1
	b	Explain about Information and Asset Value, Quantification of Risk?	5	CO-2	K2
<b>(OR)</b>					
4.	a	Explain about Risk Assessment Framework: NIST-SP-800-30?	5	CO-2	K1
	b	Describe Threat Modelling?	5	CO-2	K2
<b><u>UNIT-III</u></b>					
5.	a	Illustrate Log Protection Threats to perform Access Control?	5	CO-3	K2
	b	List and explain Various Attacks on the Authentication systems	5	CO-3	K1
<b>(OR)</b>					
6.	a	Write the differences between IDS and IPS	5	CO-3	K2
	b	Discuss the following terms Concepts of Identification, Authentication, Authorization and Accountability?	5	CO-3	K1
<b><u>UNIT-IV</u></b>					
7.	a	Explain about Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR)	5	CO-4	K2
	b	List any 3 types of facility recovery sites and explain each?	5	CO-4	K1
<b>(OR)</b>					
8.	a	Explain about Recovery Point Objective(RPO) and Work Recovery Time (WRT) ?	5	CO-4	K2
	b	What are the 5 phases in the incident response process? Explain	5	CO-4	K1
<b><u>UNIT-V</u></b>					
9.	a	Define the following terms Mail, Malware, End point protection	5	CO-5	K2
	b	Explain about Active Directory (Group Policy)?	5	CO-5	K2
<b>(OR)</b>					
10.	a	What is meant by Server Security? Explain	5	CO-5	K2
	b	Define Endpoint protection? Explain how Shadow Passwords is used to provide end point protection	5	CO-5	K2
<b><u>UNIT-VI</u></b>					
11.		Discuss Local and Remote File Inclusion, Audit Trails?	10	CO-6	K2
<b>(OR)</b>					
12.	a	Explain in detail about SQL injection with suitable example?	5	CO-6	K2
	b	List and explain about various Password Vulnerabilities,?	5	CO-6	K2

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		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) What are the various models used for predictive analytics? Elaborate.	6M	CO1	1
	b) Explain the process of converting raw data into a matrix.	4M	CO1	2
<b>(OR)</b>				
2.	Explain the process of identifying groups in the data.	10M	CO1	2
<b><u>UNIT-II</u></b>				
3.	a) Explain how decision trees are used to classify data in predictive analytics.	5M	CO2	2
	b) Write an algorithm for generating decision trees.	5M	CO2	2
<b>(OR)</b>				
4.	a) What are the stages of data classification? Give relevant example.	5M	CO2	1
	b) Explain data classification process using support vector machine.	5M	CO2	2
<b><u>UNIT-III</u></b>				
5.	a) Explain the process of data classification using Linear Regression.	5M	CO3	2
	b) Explain how deep learning models are used for classification tasks.	5M	CO3	2
<b>(OR)</b>				
6.	How is Markov Model implemented? Explain Hidden Markov Model with a relevant example.	10 M	CO3	2
<b><u>UNIT-IV</u></b>				
7.	Explain in detail the process of data preparation in predictive analytics.	10M	CO4	2
<b>(OR)</b>				
8.	a) Explain in detail about Principal Component Analysis.	5M	CO4	2
	b) What is the need for structuring the data and how it is done.	5M	CO4	1
<b><u>UNIT-V</u></b>				
9.	a) Explain the importance of data visualization in predictive analytics.	5M	CO5	2
	b) Explain the process of visualizing hidden groups in data.	5M	CO5	2
<b>(OR)</b>				
10.	a) Explain the process of visualization of decision trees.	6M	CO5	2
	b) Explain the process of visualization outliers in data.	4M	CO5	2
<b><u>UNIT-VI</u></b>				
11.	a) Illustrate the creation of different graphs using matplotlib.	4M	CO6	3
	b) Explain plotting a cosine using matplotlib.	6M	CO6	2
<b>(OR)</b>				
12.	a) Explain how is visualization used as a Predictive tool?	4M	CO6	2
	b) Explain Flock-by-leader algorithm for data visualization.	6M	CO6	3

Time: 3 Hours

Max Marks: 60

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All parts of the Question must be answered at one place

	<u><b>UNIT-I</b></u>	Marks	CO	Blooms Level
1.	a Explain the inter relationship of electrical energy and energy content in a cell.	5	1	Understanding
	b Explain how the electromotive force is generated in a cell.	5	1	Understanding
	(OR)			
2.	a Describe the required characteristics of Reversible cells.	5	1	Understanding
	b Explain what are different challenges in Energy storage Technologies.	5	1	Analysing
	<u><b>UNIT-II</b></u>			
3.	a Explain the temperature effect on batteries life.	5	2	Remembering
	b Explain the chemical reactions of Lead acid Batteries.	5	2	Analysing
	(OR)			
4.	a Explain the procedure for performance evaluation of Batteries.	5	2	Understanding
	b Explain properties of Primary batteries.	5	2	Analysing
	<u><b>UNIT-III</b></u>			
5.	Provide a concise overview of the latest advancements in electrode materials for lithium-ion batteries.	10	3	Understanding
	(OR)			
6.	Discuss the recent progress in solid electrolytes and how they are being applied in solid-state batteries.	10	3	Understanding
	<u><b>UNIT-IV</b></u>			
7.	Describe the structure and uses of super capacitors.	10	4	Remembering
	(OR)			
8.	a Explain the construction and functionality of thin-film solid-state batteries.	5	4	Remembering
	b What are the advantages & disadvantages of Polymer solid electrolytes.	5	4	Remembering
	<u><b>UNIT-V</b></u>			
9.	a What do we mean by the levels of vehicle electrification, and why are they important?	5	5	Understanding
	b How to select battery size based on application.	5	5	Analysing
	(OR)			
10.	Explain USABC and DOE targets for vehicular energy storage systems	10	5	Understanding
	<u><b>UNIT-VI</b></u>			
11.	a Write short notes on Simulation of batteries.	5	6	Applying
	b Explain Environmental concern in battery production.	5	6	Remembering
	(OR)			
12.	a Draw the Equivalent circuit of battery and do needful analysis.	5	6	Analysing
	b Explain Environmental concerns in recycling of batteries	5	6	Remembering

**III B.Tech II Semester Regular Examinations, April,2025  
IoT Web development and Applications  
(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

			<b>Marks</b>	<b>CO</b>	<b>Blooms Level</b>
<b><u>UNIT-I</u></b>					
1.	a	Explain internal and external style sheets with appropriate examples	5M	CO1	L3
	b	Explain CSS border and background properties with examples.	5M	CO1	L2
<b>(OR)</b>					
2.	a	What are the advantages and disadvantages of Potential Future Developments in IoT Data Visualization?	5M	CO1	L2
	b	Develop a Use Case of IoT Data Visualization for home automation example	5M	CO1	L3
<b><u>UNIT-II</u></b>					
3.	a	Explain control structures in Java script with examples	5M	CO2	L2
	b	Write a Java script for random number generation	5M	CO2	L3
<b>(OR)</b>					
4.	a	Explain different date object methods in Javascript with examples.	5M	CO2	L2
	b	How do you pass array elements to a function? Explain	5M	CO2	L2
<b><u>UNIT-III</u></b>					
5.	a	Discuss configuring the Android SDK	5M	CO3	L2
	b	What are the main things you have to be cautious about when writing IOT applications for mobile?	5M	CO3	L1
<b>(OR)</b>					
6.	a	What are the advantages and disadvantages of hybrid apps?	5M	CO3	L2
	b	What is the best way for a server to notify an app that some new data is available? Give an example related to the IOT System	5M	CO3	L3
<b><u>UNIT-IV</u></b>					
7.	a	Write in detail on Smart Farming IoT Applications in Agriculture	5M	CO1	L2
	b	How does Precision Farming help to increase productivity in Agriculture? Explain	5M	CO1	L3
<b>(OR)</b>					
8.	a	What are the main design principles, and needed capabilities for Weather Monitoring System using IoT? Explain	5M	CO1	L3
	b	Write short notes on deploying Drones for spraying pesticides in Agriculture	5M	CO1	L2

**UNIT-V**

- |    |   |   |    |     |    |
|----|---|---|----|-----|----|
| 9. | a | Describe ADL recognition by IOT-based application System              | 5M | CO5 | L2 |
|    | b | What impact will the IoT have on the healthcare sector? Give examples | 5M | CO5 | L2 |

**(OR)**

- |     |   |   |    |     |    |
|-----|---|---|----|-----|----|
| 10. | a | Explain a simple SBC-ADL IOT application in detail.                     | 5M | CO5 | L2 |
|     | b | How to design and construct the SBC-ADL system in IoT? Given an example | 5M | CO5 | L3 |

**UNIT-VI**

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|-----|---|---|----|-----|----|
| 11. | a | What smart medical devices are used to monitor health? Explain  | 5M | CO6 | L3 |
|     | b | Describe wearable devices in IoT engaged for Remote monitoring of Physiological parameters in detail. | 5M | CO6 | L2 |

**(OR)**

- |     |   |  |    |     |    |
|-----|---|--|----|-----|----|
| 12. | a | Illustrate diabetes checking and monitoring earable device in detail         | 5M | CO6 | L2 |
|     | b | Write short notes on technical challenges in Blood Pressure wearable devices | 5M | CO6 | L3 |

**III B.Tech II Semester Regular Examinations, April,2025  
ROBOT PROGRAMMING AND APPLICATIONS  
(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  |
|------------------------|---|-------|-----|---------------|
| <b><u>UNIT-I</u></b>   |   |       |     |               |
| 1.                     | Describe the fundamental principles of Robot Programming Basics and discuss how they are applied in industrial automation.  | 10    | CO1 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 2.                     | Compare and contrast VAL-II (VAL – Version II) and MAL (Manipulator Assembly Language) in terms of their features, capabilities, and applications in robotic programming. | 10    | CO1 | Applying      |
| <b><u>UNIT-II</u></b>  |   |       |     |               |
| 3.                     | Explain the different levels of robot programming, including low-level, language-based, and task-level programming.   | 10    | CO2 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 4.                     | Analyse the role of robot programming in various industrial applications, such as automotive manufacturing, electronics assembly, and food processing.                    | 10    | CO2 | Analysing     |
| <b><u>UNIT-III</u></b> |   |       |     |               |
| 5.                     | Discuss their roles in motion control, feedback sensing, collision detection, and power transmission in industrial robots   | 10    | CO3 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 6.                     | Compare and contrast industrial robot programming with mobile robot programming in terms of their objectives, requirements, and programming methodologies.                | 10    | CO3 | Understanding |
| <b><u>UNIT-IV</u></b>  |   |       |     |               |
| 7.                     | Describe how robots are employed in assembly processes across industries, including automotive, electronics, and consumer goods manufacturing.                            | 10    | CO4 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 8.                     | Explain the advantages of using robots for welding tasks in automotive, aerospace, and fabrication industries   | 10    | CO4 | Understanding |
| <b><u>UNIT-V</u></b>   |   |       |     |               |
| 9.                     | Explain the concept of microbots and their significance in various fields, such as healthcare, biotechnology, and nanotechnology  | 10    | CO5 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 10.                    | Provide examples of industries and applications where mobile robots have demonstrated significant benefits.   | 10    | CO5 | Applying      |
| <b><u>UNIT-VI</u></b>  |   |       |     |               |
| 11.                    | Describe the potential risks and benefits associated with the integration of nanorobots into medical treatments.  | 10    | CO6 | Understanding |
| <b>(OR)</b>            |   |       |     |               |
| 12.                    | Evaluate the impact of recent advancements in robotics on society, economy, and healthcare delivery.  | 10    | CO6 | Evaluating    |

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

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			Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>					
1.	a	Define smart water management and list two potential benefits of its implementation.	5	1	2
	b	Critically assess the role of inclusive governance in the successful implementation of smart water management strategies.	5	1	3
<b>(OR)</b>					
2.	a	Explain the role of smart technology in improving water access and quality.	5	1	2
	b	Compare and contrast traditional water management approaches with smart water management techniques	5	1	3
<b><u>UNIT-II</u></b>					
3.	a	Define municipal solid waste and discuss two factors influencing its generation.	5	2	2
	b	Propose innovative methods for reducing the labor requirement in solid waste collection and transfer.	5	2	3
<b>(OR)</b>					
4.	a	Explain the importance of an efficient collection system for solid waste management.	5	2	2
	b	Critically assess the role of technology in improving the efficiency of solid waste collection and transfer.	5	2	3
<b><u>UNIT-III</u></b>					
5.	a	Explain the purpose of mechanical volume reduction in solid waste processing.	5	3	2
	b	Critically evaluate the environmental impacts of incinerators on surrounding communities	5	3	3
<b>(OR)</b>					
6.	a	Describe the necessary equipment used in chemical volume reduction of solid waste.	5	3	2
	b	Discuss the legal and regulatory frameworks governing the operation of incinerators and sanitary landfills.	5	3	3
<b><u>UNIT-IV</u></b>					
7.	a	Define hazardous waste and provide examples of sources of hazardous wastes.	5	4	2
	b	Propose strategies for the sustainable management and disposal of nuclear wastes in the context of growing energy demands.	5	4	3
<b>(OR)</b>					



- |    |   |   |   |   |   |
|----|---|---|---|---|---|
| 8. | a | Explain the importance of proper storage and collection procedures for hazardous wastes.                          | 5 | 4 | 2 |
|    | b | Critically assess the methods used for the protection of public health and the environment from hazardous wastes. | 5 | 4 | 3 |

#### **UNIT-V**

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|-------------|---|---|---|---|---|
| 9.          | a | Explain how hazardous wastes are identified and classified in industrial settings.                                      | 5 | 5 | 2 |
|             | b | Discuss the ethical considerations involved in the management and disposal of hazardous wastes in developing countries. | 5 | 5 | 3 |
| <b>(OR)</b> |   |   |   |   |   |
| 10.         | a | Discuss the methods used to quantify the quantities of hazardous waste generated.                                       | 5 | 5 | 2 |
|             | b | Propose innovative solutions to address future challenges in the management of hazardous wastes.                        | 5 | 5 | 3 |

#### **UNIT-VI**

- |             |   |  |   |   |   |
|-------------|---|--|---|---|---|
| 11.         | a | Define biomedical wastes and provide examples of different types.  | 5 | 6 | 2 |
|             | b | Discuss the potential health risks associated with exposure to biomedical and chemical wastes and suggest preventive measures. | 5 | 6 | 3 |
| <b>(OR)</b> |   |  |   |   |   |
| 12.         | a | Discuss the environmental effects of inorganic pollutants derived from chemical wastes.  | 5 | 6 | 2 |
|             | b | Evaluate the effectiveness of current methods for controlling biomedical wastes in healthcare facilities.                      | 5 | 6 | 3 |

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		<u>UNIT-I</u>	Marks	CO	Blooms Level
1.	(a)	Explain the MOS operation and derive the I-V characteristics of an NMOS transistor.	5M	CO1	Understanding
	(b)	Illustrate a 2-input NOR circuit using CMOS transistors	5M	CO1	Applying
		(OR)			
2.		Describe the operation of a CMOS inverter with its voltage transfer characteristics.	10M	CO1	Understanding
		<u>UNIT-II</u>			
3.	(a)	What is floorplanning in VLSI design? Explain its optimization goals.	5M	CO2	Understanding
	(b)	Compare and contrast slicing and non-slicing floorplan representations.	5M	CO2	Analysing
		(OR)			
4.		<b>Explain</b> the primary optimization goals in floor planning and their importance.	10M	CO2	Understanding
		<u>UNIT-III</u>			
5.	(a)	Explain the design considerations for a power-ground distribution network in VLSI circuits.	5M	CO3	Understanding
	(b)	Compare planar routing and mesh routing techniques.	5M	CO3	Analysing
		(OR)			
6.	(a)	What is power and ground routing in VLSI design? Why is it critical in chip design?	5M	CO3	Remembering
	(b)	List the different types of routing techniques used in designing power-ground distribution networks.	5M	CO3	Remembering
		<u>UNIT-IV</u>			
7.	(a)	What are the optimization objectives in global placement? Explain the min-cut placement algorithm.	5M	CO4	Understanding
	(b)	Discuss the challenges in detailed placement.	5M	CO4	Understanding
		(OR)			
8.	(a)	List the key optimization objectives in placement.	5M	CO4	Remembering
	(b)	Define global placement and detailed placement.	5M	CO4	Remembering
		<u>UNIT-V</u>			
9.	(a)	Explain the recursive geometric matching algorithm for clock tree synthesis.	5M	CO5	Understanding
	(b)	Define clock skew and explain the importance of clock tree synthesis in VLSI design.	5M	CO5	Understanding
		(OR)			
10.	(a)	Explain the recursive geometric matching algorithm for clock tree synthesis.	5M	CO5	Understanding
	(b)	Discuss the impact of clock skew on the timing performance of a circuit.	5M	CO5	Understanding
		<u>UNIT-VI</u>			
11.	(a)	What is static timing analysis? Explain setup and hold time constraints with examples.	5M	CO6	Understanding
	(b)	Discuss the role of gate sizing in physical synthesis.	5M	CO6	Understanding
		(OR)			
12.	(a)	Explain the concept of buffering and its importance in timing optimization.	5M	CO6	Understanding
	(b)	Discuss the impact of netlist restructuring on circuit performance.	5M	CO6	Understanding