Code No: 80425 | MR18(2018-19) | HT.NO:

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.

B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Digital Image Processing

BRANCH: ECE

Time: 3 hours | **Max. Marks: 70**

Answer all questions | **5X14M=70 M**

All Questions carries equal marks

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Describe the elements of digital image processing in detail. b) Explain four basic relationships between pixels.	7 7	L2 L3	1
	OR			
2.	a) Explain the chain code derivative in 4 and 8 connectivity b) Explain the concept of quantization mechanisms on analog images.	7 7	L2 L2	1
3.	a) Explain the properties of Discrete Cosine Transform and how it is useful in DIP? b) How are different transforms used in DIP? Explain the most advantageous one in detail.	7 7	L2 L3	2
	OR			
4.	a) With mathematical expressions discuss Hotelling transform and explain how it is useful in Image processing. How it is different from other transforms. b) Explain the properties of Walsh-Hadamard transforms.	7 7	L2 L3	2
5.	a) Perform the histogram equalization of the image $\begin{bmatrix} 4&4&4&4&4 \\ 3&4&5&4&3 \\ 3&5&5&5&3 \\ 3&4&5&4&3 \end{bmatrix}$ b) Distinguish between spatial domain techniques and frequency domain techniques of Image enhancement.	7 7	L2 L3	3
	OR			
6.	a) Explain image subtraction, averaging, smoothening and sharpening with suitable Illustrations. b) Illustrate with suitable examples how are gradient operators used in detecting the edges in medical images	7 7	L3 L4	3
7.	a) What is the purpose of Color model? Describe the method of converting colors from one model to other models. b) What are the two approaches for blind image restoration? Explain in detail.	7 7	L2	4
	OR			
8.	a) Explain about interactive image restoration. What are the advantages of adaptive filters? Explain about adaptive median filter. b) What is color image smoothing? Explain how smoothing will done by neighborhood averaging.	7 7	L2 L2	4

9.	a) How are lines and edges detected? Explain with mathematical models. b) Explain the different types of redundancies.	7 7	L3 L2	5
	OR			
10.	a) Determine Huffman coding assignment procedure with a suitable example. How do you compute the average length of the code and the entropy of the source? Is Huffman code uniquely decodable? If so justify your answer. b)Explain image segmentation based on i) Region extraction ii) Pixel based approach iii) multi-level threshold	7 7	L4 L2	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

Code No: 80438 | MR18(2018-19) | HT.NO:

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.

B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Internet of Things

BRANCH: ECE

Time: 3 hours | **Max. Marks: 70**

Answer all questions | **5X14M=70 M**

All Questions carries equal marks

Q.NO	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Describe generic block diagram of an IoT device and discuss various key elements with neat sketch. b) Describe the logical design of IoT with a neat illustration.	7 7	L3	1
	OR			
2.	a) Demonstrate two specific communication APIs b) Explain the various IoT levels with some examples.	7 7	L3	1
3.	a) Determine the IoT levels for designing home automation IoT system including smart lighting and intrusion detection b) Determine the IoT levels for designing tracking package handling system.	7 7	L2	2
	OR			
4.	a) Describe about domain specific IoT's with neat sketch. b) Explain about weather monitoring system with IoT level.	7 7	L2	2
5.	a) What are the differences between SDN and NFV? b) Discuss the role of YANG in IoT system.	7 7	L3	3
	OR			
6.	a) Explain the role of NETCONF Server. b) Compare and Contrast between IoT and M2M.	7 7	L2	3
7.	a) What is the difference between procedural oriented and object oriented programming. b) Elaborate the python data types and data structures with suitable examples.	7 7	L2	4
	OR			
8.	a) Explain different types of control flow in python programming. b) Describe about packages and file handling with python.	7+7	L2	4
9.	a) Write a Python programming to controlling LED with Raspberry Pi. b) Explain about IoT device and Exemplary Device.	7 7	L3	5
	OR			
10.	a) List the other IoT devices and explain in detail. b) Explain the raspberry Pi board in detail with a diagram.	7 7	L3	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

Code No: 80426 | MR18(2018-19) | HT.NO:

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.

B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Microwave Engineering and Radar Systems

BRANCH: ECE

Time: 3 hours | **Max. Marks: 70**

Answer all questions | **5X14M=70 M**

All Questions carries equal marks

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Mention different microwave regions, band designations and the corresponding services of electromagnetic waves.	7	L2	1
	b) Calculate the characteristic impedance of a micro strip line from the data given. $\varepsilon_r = 4.28$, h = 6.3 mils, t = 5.3 mils, w = 10 mils.	7	L3	
	OR			
2.	a) Derive the wave equation for a TM wave and obtain all the field components in a rectangular wave guide.	8	L4	1
	b) Write short notes on: (i) Wave guide irises (ii) Dielectric phase shifter	6	L2	
3.	a) With the help of apple gate diagram, explain velocity modulation and the working of a Reflex Klystron.	7	L2	2
	b) With a neat sketch, describe the working of E-Plane Tee. What are its properties? Obtain its S-matrix	7	L3	
	OR			
4.	a) What are the limitations of conventional vacuum tubes at microwave frequencies? Explain how these limitations can be overcome.	7	L2	2
	b) Describe with a neat sketch, the working of a 4-port directional coupler, and obtain S-matrix when the coupling factor is 3dB.	7	L3	
5.	a) How does a magnetron sustain its oscillations using this crossed field? Assume π mode for explaining the same.	7	L3	3
	b) Explain the method of microwave power measurement using Bolometer.	7	L2	
	OR			
6.	a) Explain GUNN effect using the two-valley theory.	7	L2	3
	b) Explain the method of Low and High VSWR measurement using Microwave Bench setup.	7	L2	
7.	a) What is meant by minimum detectable signal in radar? Discuss the effects of integration of radar pulses.	7	L2	4
	b) Calculate the maximum range of guided missile tracking radar operate at 5 GHz with a 1 M Watt peak power output. If the antenna diameter is 3 m and the receiver has a bandwidth of 2 MHz with 10 dB noise figure. The target cross-section is 2 m^2.	7	L3	
	OR			
8.	a) Derive the maximum range for a radar system from first principles. Explain the applications of radar.	7	L4	4
	b) Draw the block diagram of pulsed radar and explain its operation.	7	L2	

9.	a) With the Block diagram, explain the operation of a CW radar with non-zero IF. b) List the limitations of single delay line cancellers and derive its associated equations.	7 7	L2 L4	5
	OR			
10.	a) Explain the principle of operation of MTI radar with power oscillator transmitter with a neat block diagram. b) Define blind speed. MTI radar operates at 5 GHz with a PRF of 100PPS. Determine the three lowest blind speeds of this Radar. Explain the importance of Staggered PRF.	7 7	L2 L2	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

Code No: 80435 | MR18(2018-19) | HT.NO:

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.

B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Embedded System Design

BRANCH: ECE

Time: 3 hours | **Max. Marks: 70**

Answer all questions | **5X14M=70 M**

All Questions carries equal marks

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) What is Embedded System? Explain different application of embedded system b)Distinguish between embedded systems and general purpose Systems.	9 5	L2 L3	1
	OR			
2.	a) Explain the role of microprocessors and controllers in embedded system design. b) Explain the elements of the embedded system	8 6	L2	1
3.	a) Categorize the memories used in embedded system design. b) List the sequence of operations in I2C device.	7 7	L2	2
	OR			
4.	Give a detailed description on communication interfaces in embedded design.	14	L4	2
5.	a) Explain the role of RTC in embedded system design with examples. b) What is watch dog timer? Also explain its role in embedded system with examples.	7 7	L3	3
	OR			
6.	a) Discuss the importance of oscillator circuit in embedded system. b) Discuss the different approaches available for embedded firmware development.	5 9	L3	3
7.	Explain the different multitasking models in the operating system.	14	L4	4
	OR			
8.	a)Discuss the basic functions of a real time kernel b) Categorize the algorithms in non-preemptive scheduling with merits and demerits of each	4 10	L4	4
9.	Explain device driver in the embedded system design context and give the applications of device drivers.	14	L4	5
	OR			
10.	a) Analyze the different methods of handling deadlocks b) Explain the different functional and non-functional requirements that need to be evaluated in the selection of an RTOS.	5 9	L3	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

Code No: 80433

MR18(2018-19)

HT.NO:

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.

B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Fundamentals of Machine Learning

BRANCH: ECE

Time: 3 hours **Max. Marks: 70**

Answer all questions **5X14M=70 M**

All Questions carries equal marks

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	Analyze the steps involved in the data preprocessing in detail.	14	L4	1
	OR			
2.	a) Categorize and explain the machine learning techniques. b) List out and discuss the applications of machine learning.	7 7	L2 L2	1
3.	a) Demonstrate the implementation of support vector machine. b) Explain overfitting and underfitting in machine learning.	7 7	L3 L2	2
	OR			
4.	Describe the following in detail: i. Regression ii. Classification iii. Clustering	14	L2	2
5.	a) Show the architecture of neural network and explain each component in the architecture. b) Illustrate the usage of independent component analysis.	7 7	L2 L3	3
	OR			
6.	a) State the k-means algorithm and assess the algorithm with example. b) Examine the procedure for principal component analysis.	7 7	L3 L4	3
7.	a) Summarize and discuss the risks of semi supervised learning. b) Analyze the importance of large-scale algorithms.	7 7	L2 L4	4
	OR			
8.	a) Outline the paradigms for semi-supervised learning. b) Assess the usage of graph-based semi-supervised learning algorithms.	7 7	L2 L3	4
9.	a) Name the elements of reinforcement learning and discuss. b) Interpret the value iteration algorithm for model-based learning.	7 7	L2 L4	5
	OR			
10.	a) Summarize the current problems in machine learning. b) Demonstrate the implementation of Q learning algorithm.	7 7	L2 L3	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

Code No: 80535

MR18(2018-19)

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B.TECH IV YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2022

SUBJECT: Cloud Computing

BRANCH: ECE

Time: 3 hours **Max. Marks: 70**

Answer all questions **5X14M=70 M**

All Questions carries equal marks

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Describe the various layers and types of clouds. b) Write the challenges and risks of cloud computing.	7 7	L2	1
	OR			
2.	a) Describe the System Models for Distributed and Cloud Computing. b) Explain the basic principles of Cloud Computing.	7 7	L3 L2	1
3.	Explain the different levels of virtualization implementation.	14	L3	2
	OR			
4.	a) Explain the differences between full-virtualization and para-virtualization. b) Explain about vCUDA architecture.	7 7	L3 L3	2
5.	a) Analyze the Architectural Design of Compute in cloud computing b) Examine the Storage Clouds	7 7	L3 L2	3
	OR			
Q6.	a) Explain the layered cloud architectural development with neat diagram. b) List and explain the architectural design challenges	7 7	L2 L3	3
Q7.	Describe the Cloud Security Defense Strategies and Distributed Intrusion/Anomaly Detection.	14	L3	4
	OR			
Q8.	a) What is the importance of security in the Cloud Computing? b) List the categories in the Current Stage of Data Security in the Cloud.	6 8	L2 L2	4
Q9.	Analyze the parallel and distributed programming paradigms in cloud computing.	14	L2	5
	OR			
Q10.	a) Describe the standards for messaging. b) List the Common Standard "The Open Cloud Consortium" in cloud computing.	7 7	L3 L3	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.