Enrolment No: ~~A3A~~ E22CSEU0827   Name of Student: MADHAV GUPTA

Department/ School: SCSET

MID-TERM EXAMINATION, ODD SEMESTER 2024

COURSE CODE: CSET225	**MAX. DURATION:** 1 HRS
COURSE NAME: Intelligent Model Design using AI	
PROGRAM: B.Tech. 5th Semester	**TOTAL MARKS:** 15

Mapping of Questions to Course and Program Outcomes								
Q. No.	A1	A2	A3	A4	A5	A6	B1	B2
CO	CO1	CO1	CO2	CO1	CO2	CO2	CO3	CO3
BTL	L1	L2	L2	L4	L2	L1	L3	L2

GENERAL INSTRUCTIONS: -

1. Do not write anything on the question paper except **name, enrolment number** and **department/school.**

2. Carrying mobile phones, smartwatches and any other non-permissible materials in the examination hall is an act of **UFM.**

COURSE INSTRUCTIONS:

a) Attempt any five out of the six questions in section A

b) Attempt any one out of the two questions in section B

SECTION A (Maximum marks: 10)

A1.   Explain the drawbacks of Artificial Neural Networks (ANN). Discuss why Convolutional Neural Networks (CNN) were introduced as a more effective solution. (Marks: 1+1)

A2.   Describe the different types of datasets with examples. How these datasets differ in terms of structure and application. (Marks: 1+1)

A3.   What are adversarial attacks in the context of machine learning models? Explain how these attacks work, providing examples of different types of adversarial attacks. (Marks: 1+1)

A4.   What are the key differences between the Internet of Things (IoT) and the Artificial Intelligence of Things (AIoT)? Compare cloud-based and edge-based computing in AIoT. (Marks: 1+1)

A5.   Explain the encoder-decoder architecture. How does this architecture differ from the U-Net architecture? (Marks: 1+1)

A6. Define underfitting and overfitting in the context of machine learning models. Discuss various techniques to reduce overfitting. (Marks: 1+1)

SECTION B (Maximum Marks: 5)

B1. A CNN architecture is given. Provide the input and output shapes for the following, assuming there is no padding. (Marks: 1x5)

Layer Type	Layer Details	Input Shape	Output Shape
Input	Input Image	(32, 32, 3)	(32, 32, 3)
Convolutional	Conv2D (32 filters, 3x3)		
Convolutional	Conv2D (64 filters, 3x3)		
Max Pooling	MaxPooling2D (2x2)		
Flatten	Flatten		
Dense	Dense (128 units)		

B2. Define Generative Adversarial Networks (GANs) and explain their key components. What is the objective function of a GAN? Demonstrate any two types of GANs. (Marks: 2+1+2)