Printed Page:- 04 **Subject Code**:- **ACSE0701**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2023-2024)

Subject: Computer Vision

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. In transfer learning, what is the purpose of the "fine-tuning" process? (CO2) 1

(a) Rewriting the entire model architecture

(b) Adapting the pre-trained model to a new task

(c) Eliminating all previous knowledge from the model

(d) Reducing the number of parameters in the model

1-b. Computer Vision is _____ (CO1) 1

(a) The study of computer graphics

(b) The study of algorithms for visual perception by computers

(c) The study of computer hardware

(d) The study of computer networking

1-c. In RNN (CO2) 1

(a) No Feed Back link

(b) At least one Feed Back link from output layer to the input layer

(c) No feed forward link

(d) None of the above

1-d. Deep learning is useful as (CO1) 1

(a) Non linear function can be represented in a better way

(b) linear function can be represented in better way

(c) polynomial function can be represented in better way

(d) None of the above..

1-e. State the purpose of pixel transformations in image processing(CO3) 1

(a) To change the aspect ratio of an image

(b) To resize the image

(c) To enhance or modify pixel values

(d) To add noise to the image

1-f. Points whose locations are known exactly in the input and reference images are used in Geometric Spacial Transformation(CO5). 1

(a) Known points

(b) Key-points

(c) Réseau points

(d) Tie points

1-g. Visual dialogue refers to:(CO3) 1

(a) A conversation between two cameras

(b) A conversation where text and images are exchanged

(c) A type of optical illusion

(d) A type of image segmentation

1-h. What type of neural network layers are commonly used in DCGAN(CO5) 1

(a) Recurrent layers

(b) ully connected layers

(c) Convolutional layers

(d) Max-pooling layers

1-i. In computer vision, which term is often used to describe the process of labeling regions of an image with object categories?(CO4) 1

(a) Segmentation

(b) Desaturation

(c) Amplification

(d) Erosion

1-j.	Mention vision includes object recognition and 3D scene Interpretation(CO4) (a) Low-level vision (b) Intermediate-level vision (c) High-level vision (d) All of the above	1

2. Attempt all parts:-

2.a.	Define convolution briefly.(CO2)	2
2.b.	List out the diffrence between CNN and ANN(CO1)	2
2.c.	State the key difference between instance segmentation and semantic segmentation(CO3)	2
2.d.	Illustrate concept of Deep Generative Model (DGM)(CO5)	2
2.e.	State the main advantage of Faster R-CNN over Fast R-CNN(CO4)	2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a.	Describe computational graph in Deep Learning (CO2)	6
3-b.	Define retrieval of image based on their contents.(CO1)	6
3-c.	Describe the key architectural components of LeNet-5, including the types of layers used. (CO2)	6
3-d.	Briefly explain for what purpose Inception network used for (CO1)	6
3.e.	Describe different upsampling methods used in convolutional neural networks for image segmentation.(CO3)	6
3.f.	State VAEs and GANs, and what are their key differences(CO5)	6
3.g.	State the ImageNet Large Scale Visual Recognition Challenge.(CO4)	6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a.	How can computer vision techniques be applied to reconstruct the three-dimensional motion of objects (CO1)	10
4-b.	Write notes in details: Parameter Sharing and Translation Invariance (CO1)	10

5. Answer any <u>one</u> of the following:-

5-a.	Discuss the advantages of the GoogLeNet architecture, particularly in terms of computational efficiency. (CO2)	10
5-b.	CNN architecture to used for image classification explain briefly. (CO2)	10

6. Answer any <u>one</u> of the following:-

6-a.	Compare the use of Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU) networks in image processing applications.(CO3)	10
6-b.	Discuss various vision models used in computer vision tasks. How do models like VGG, ResNet, and Inception differ in terms of architecture and application(CO3)	10

7. Answer any <u>one</u> of the following:-

7-a.	Differentiate between object classification, instance recognition, and category recognition.(CO4)	10
7-b.	State that can deep learning techniques like Convolutional Neural Networks (CNNs) be applied to improve object detection accuracy and speed(CO4)	10

8. Answer any <u>one</u> of the following:-

8-a.	Describe the architecture and components of a typical GAN, including the generator and discriminator networks(CO5)	10
8-b.	Explain the advantages and disadvantages of using a Wasserstein distance-based loss function in GANs compared to the original GAN loss(CO5)	10