Printed Page:-04

Subject Code:- ACSE0701 /ACSEH0701	

_ (CO1,K

Max. Marks: 100

20

1

1

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2024 - 2025)

Subject: Computer Vision

Time: 3 Hours

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

1. Attempt all parts:-

1-a. common task in computer vision is

- (a) Speech recognition
- (b) Image classification
- (c) Sorting algorithms
- (d) Database management
- 1-b. The primary goal of image segmentation in computer vision is _____(CO1, K1)
 - (a) Recognizing objects in an image
 - (b) Dividing an image into regions with similar properties
 - (c) Compressing image data
 - (d) Enhancing image resolution
- 1-c. In transfer learning, what is the purpose of the "fine-tuning" process? (CO2,K1) 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-d. Mention technique is commonly used to minimize false positives in moving object 1 detection?(CO2,K1)
 - (a) Background modeling

	(b)	Adaptive learning	
	(c)	Data association	
	(d)	Model pruning	
1-e.	D	efine the primary goal of image segmentation (CO3,K1)	1
	(a)	Image classification	
	(b)	Object recognition	
	(c)	Partitioning an image into meaningful regions	
	(d)	Image compression	
1-f.	St	ate the purpose of pixel transformations in image processing(CO3, K1)	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-g.	St cł	ate the following techniques can be used to reduce the number of nannels/feature maps(CO4, K2)	1
	(a)	Pooling	
	(b)	Padding	
	(c)	1×1 convolution	
	(d)	Batch Normalization	
1-h.	List down how do you introduce non-linearity in a Convolutional Neural Network (CNN)(CO4, K2)		
	(a)	Using ReLU	
	(b)	Using a Max-Pooling layer	
	(c)	Both of the above	
	(d)	None of the above	
1-i.	Li	ist down of the following is the abbreviation of JPEG(CO5, K1).	1
	(a)	Joint Photographic Experts Group	
	(b)	Joint Photographs Expansion Group	
	(c)	Joint Photographic Expanded Group	
	(d)	Joint Photographic Expansion Group	
1-j.		enhance Image Differentiation(CO5, K1)	1
	(a)	Pixel Density	
	(b)	Contours	
	(c)	Edges	
	(d)	None of the mentioned	
2. Atte	empt a	all parts:-	
2.a.	D (C	ifferentiate between a single-layer perceptron and a multi-layer perceptron. CO1,K2)	2

Page 2 of 4

•

2.b.	Shortly describe transfer learning (CO2,K2)	2
2.c.	State spatial operations in image processing primarily concerned with(CO3, K2)	2
2.d.	Illustrate is the sliding windows technique in object detection(CO4, K2)	2
2.e.	Discuss process of Varriotional Auto Encoders VAEs handle the latent space(CO5, K2)	2
SECT	ION-B	30
3. Ans	wer any <u>five</u> of the following:-	
3-a.	Discuss computer vision algorithms being applied in healthcare.(CO1,K2)	6
3-b.	Can you provide insights into the advancements in real-time image classification systems (CO1,K2)	6
3-c.	Illustrate that hyperparameters be trained in neural networks (CO2,K2)	6
3-d.	Name Deep Learning algorithm is best for image classification. Explain (CO2,K2)	6
3.e.	Explain Convolutional Neural Networks (CNNs) contribute to object detection and image segmentation in computer vision applications(CO3, K2)	6
3.f.	Explain is the difference between object detection and object recognition(CO4, K2)	6
3.g.	Illustrate some advantages of combining VAEs and GANs(CO5, K2)	6
SECT	ION-C	50
4. Ans	wer any <u>one</u> of the following:-	
4-a.	Differentiate between a convolutional layer and an inception module in a Google net network architecture (CO1, K2)	10
4-b.	Explain filtering, stride and padding in Convolutional Neural Network (CO1,K2)	10
5. Ans	wer any <u>one</u> of the following:-	
5-a.	In what domains or applications has LeNet-5 demonstrated success, and why is it well-suited for these tasks?(CO2,K3)	10
5-b.	Explain the use of the convolution layer in CNN with example (CO2,K2)	10
6. Ans	wer any <u>one</u> of the following:-	
6-a.	Describe the role of edge detection in image processing and its applications in image segmentation and feature extraction. (CO3,K2)	10
6-b.	Explain the difference between single-shot and two-shot object detection approaches, and provide examples of each.(CO3, K2)	10
7. Ans	wer any <u>one</u> of the following:-	
7-a.	Differentiate between object classification, instance recognition, and category recognition.(CO4, K2)	10
7-b.	Illustrate beirfly some real-world applications of object detection, and how do they impact our daily lives(CO4, K2)	10
8. Ans	wer any <u>one</u> of the following:-	
8-a.	Describe the architecture and components of a typical GAN, including the	10

Page 3 of 4

•

generator and discriminator networks(CO5, K2)

8-b. Explain the concept of mode collapse in GANs. What strategies can be employed 10 to mitigate mode collapse(CO5, K2)

op. tur phone and

•