

- (b) Explain diagrammatically the progressive mesh representation of an object and its impact on the 3D model. 10,6
7. (a) Explain the steps involved in determining shapes from textures. Are there any complexities involved? Justify your answer.
- (b) What is a surface? How is a Lambertian surface different from a normal surface? 10,6

Unit-IV

8. What is face detection? How is it different from face recognition? Discuss 3D shape models of faces. 16
9. Write short notes on the following:
- (i) Surveillance
 - (ii) Background separation
 - (iii) Gait analysis
 - (iv) Chamfer matching
- 4×4=16

67104-N

(4)

RR-496

Roll No. :

Total No. of Questions : 9] [Total No of Pages : 4

67104-N

MCA 3rd Semester (Regular) Examination,
 February-2022
 (MCA 2 Year Programme)
 (w.e.f. 2020-21)
 Paper-21MCA23DA1
COMPUTER VISION ELECTIVE 1 (B)

Time : Three Hours] [Maximum Marks : 60

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note - Attempt five questions in all, selecting one question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following questions :
- (a) Define Filtering.
 - (b) What does a low pass filter does? Write its another name.

67104-N

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RR-496 P.T.O

- (c) What is full form of PCA ?
- (d) Comment on/Justify the statement :
Thresholding may be used to narrow the edge of an object.
- (e) Name two methods for surface representation.
- (f) Define Motion.
- (g) What do you mean by occlusion ?
- (h) Define Human Gait. 2×8=16

Unit-1

2. What do you understand by Linear shift-invariant image filtering ? Explain the process of Box filtering for the figure below starting from the upper left corner of image (marked) and fill the output image :

$f(x,y)$	Kernel	image $f(x,y)$	Output $f(x,y)$
1	1 1 1 1 1 1 1 1 1	0 0	
x	1 1 1	0 0 0 0 0 0 0 0	16

3. (a) What are edges ? Why is edge detection important for image processing ? Critically compare the working of LOG and Laplacian filters used in edge detection.
- (b) Explain why a median filter is able to smooth images without introducing blurring.
- 10,6

Unit-II

4. Describe the Hough transform approach to circular object detection. Explain its advantages relative to centroidal plot approach. Illustrate your answer with reference to location of circles of known radius R.
5. Describe the chord-tangent methods for location of ellipses in images. Illustrate and explain the properties used in such detection. Justify the use of chord-tangent method by proving its validity for circle detection.
- 16

Unit-III

6. (a) Define binocular vision and related terms. Illustrate and compare the effectiveness of binocular vision and photometric stereo to detect a depth map for an object in a scene.