

2022

1st Semester Examination

COMPUTER SCIENCE

Paper : COS 103

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

COS 103 (M1)

(Pattern Recognition)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What do you mean by feature extraction?
2. What is cluster analysis?
3. What do you mean by Classification?
4. What is good clustering?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. What do you mean by pattern recognition? Write its applications. $1+3$

P.T.O.

6. Differentiate between Eager and Lazy Learning. 4
7. What is meant by the curse of dimensionality? 4
8. Write the differences between supervised and unsupervised learning. 4

Group - C

Answer any *one* question : $8 \times 1 = 8$

9. Explain the design cycle of a pattern recognition system. 8
10. Explain artificial neural networks. 8

COS 103 (M2)

(Image Processing)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. Write expression for Gray, Log and Gamma transformations.
2. Categorize the various frequency domain filters.
3. Write the sobel and prewitt operators.
4. What do you mean by Morphological Image Processing?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Compare between Contrast Stretching and Histogram Processing for image enhancement.

6. Compare between High-pass filter and Low-pass filter in frequency domain.
7. Explain the process of Dilation and Erosion used in morphological image processing.
8. What is thresholding? What is the role of thresholding in image processing.

Group - C

Answer any *one* question : 8×1=8

9. Describe histogram equalization. Obtain histogram equalization for the following image segment of size 5×5 . Write the interference on the image segment before and after equalization :

20 18 20 18 16

15 15 16 18 15

15 16 19 15 17

16 17 19 18 16

15 18 17 20 15 (5×5) matrix 2+6

10. (a) Consider the image segment shown below. Let $V = (2, 3, 4)$, compute the length of shortest 4-, 8- and m-path between p and q.

If any particular path does not exist between these two points, explain why?

P.T.O.

(4)

	3	4	1	2	0	(q)
	0	1	0	4	2	
	2	2	3	"1	4	
(p)	3	0	4	2	1	
	1	2	0	3	4	

(b) Explain (i) False contouring.

(ii) Checkboard effect.

$$4+4=8$$
