**Roll No.** | | | | | | | | | | | | **Total No. of Pages : 02**

**Total No. of Questions : 09**

**B.Tech. (IT) (Sem.–6)**

# DIGITAL IMAGE PROCESSING

**Subject Code : BTIT-612-18**

**M.Code : 79631**

**Date of Examination : 09-07-22**

**Time : 3 Hrs.** **Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

**1. Write briefly :**

a) Local *versus* Global Features of an image

b) *'Sometime we need to add noise explicitly to an image'.* Why?

c) *'Do Digitization process vary for different acquisition devices'?* Justify.

d) When do you need to apply erosion operation on an Image?

e) How do filter work? Elaborate using a sample filter of size 3 × 3.

f) Define Entropy.

g) List and define any two segmentation methods.

h) Differentiate between CMY and CMYK color model. Which one is advantageous and why?

i) Usage of luminance in defining an image.

j) Define Adaptive histogram equalization.

## SECTION-B

2. How histogram equalization may improve an image? Perform histogram equalization on following image:

| | | | | |
|---|---|---|---|---|
| 3 | 2 | 10 | 7 | 9 |
| 7 | 7 | 8 | 4 | 1 |
| 3 | 12 | 2 | 3 | 9 |
| 5 | 4 | 6 | 7 | 2 |
| 11 | 6 | 4 | 3 | 2 |

3. Explain methods of thresholding for image segmentation.

4. Explain and differentiate between Butterworth and Gaussian filters.

5. How do you extract textual features from an image?

6. Compute and compare 2D DFT and DCT of following image :

| | | | | |
|---|---|---|---|---|
| 4 | 5 | 10 | 7 | 9 |
| 6 | 7 | 1 | 4 | 1 |
| 3 | 10 | 8 | 3 | 9 |
| 4 | 5 | 7 | 7 | 3 |
| 12 | 6 | 5 | 3 | 2 |

## SECTION-C

7. Explain different types of spatial filtering techniques for digital image. Differentiate between them using appropriate masks.

8. With a neat block diagram, explain transform based image compression scheme. Also give two valid reasons for the choice of *"Discrete cosine transform"* in JPEG compression method.

9. What is benefit to find discontinuities in an image? How can morphological operations affect performance of edge detection method(s)? Explain.



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student**.