

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)**  
**B.Tech.Sem - VII ELECTRONIC ELECTRONIC :SUMMER- 2022**  
**SUBJECT : DIGITAL IMAGE PROCESSING**

Day : Friday  
Date : 3/6/2022

**S-13398-2022**

Time : 02:30 PM-05:30 PM  
Max. Marks : 60

**N.B. :**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if **NECESSARY**.

**Q.1** Describe the examples of fields that uses Digital image processing. **(10)**

**OR**

**Q.1 a)** What are the Gaussian and Impulse noise? **(05)**

**b)** What are the different types color models in image processing? Describe any one. **(05)**

**Q.2 a)** Perform histogram equalization on the following 3x3, eight level image. **(05)**

$$\begin{bmatrix} 1 & 3 & 5 \\ 4 & 4 & 3 \\ 6 & 2 & 2 \end{bmatrix}$$

**b)** How low pass filter can be constructed in frequency domain? **(05)**

**OR**

**Q.2** Describe basic intensity transformations used in image enhancement. **(10)**

**Q.3 a)** Calculate the Huffman coding for set of symbols shown in table. **(05)**

Symbol	A	B	C	D
Probability	0.4	0.3	0.2	0.1

**b)** Describe the sub-band coding technique with ties to multiresolution analysis. **(05)**

**OR**

**Q.3** What is wavelet transform? Describe the type of wavelets. **(10)**

**Q.4** Discuss basic morphological algorithms. **(10)**

- i) Boundary extraction ii) Hole filling

**OR**

**Q.4** What is mathematical morphology? Explain Hit or Miss transformation used for shape detection. **(10)**

**Q.5** What are the types of segmentation techniques? How region splitting and merging procedure is used for segmentation? **(10)**

**OR**

**Q.5 a)** How global thresholding is achieved by Otsu's method? **(05)**

**b)** Write in brief about Hough transform. **(05)**

**Q.6** What is digital video? How video motion analysis is carried out? **(10)**

**OR**

**Q.6 a)** Describe iris recognitions application in Digital image processing. **(05)**

**b)** Compare 2D and 3D images. **(05)**

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