Total No. of Questions – [04] Total No. of Printed Pages: 02

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F. Y. M. TECH. (E&TC) (SEMESTER - I)

COURSE NAME: IMAGE AND VIDEO PROCESSING

COURSE CODE: ETPA11181

(PATTERN 2018:R1)

Time: [1 Hour] [Max. Marks: 20]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) **a)** Explain how spatial and gray level resolution are associated with sampling and quantization of the two dimensional signal. Mr. Suresh has pictures captured by his old 0.3MP (640x480 pixels) mobile selfie camera few years back. He now wants to watch the old pictures with 5MP (2560x1920) resolution with good quality as if the picture taken by 5MP front camera. Suggest a suitable technique to achieve this. **(6)**

b) Define pixel adjacency in an image. Where the concept of adjacency is used in image processing. How adjacency is different from connectivity. **(4)**

OR

Q.2) **a)** A common measure of transmission for digital data is the baud rate, defined as the number of bits transmitted per second. Generally, transmission is accomplished in packets consisting of a start bit, a byte (8 bits) of information, and a stop bit. Using these facts, answer the following: **(6)**

(i) How many minutes would it take to transmit a 1024 X 1024 image with 256 gray levels using a 56K baud modem?
(ii) What would the time be at 750 K baud, a representative speed of a phone DSL (digital subscriber line) connection?

b) Explain in brief any four applications of digital image processing. **(4)**

Q.3) **a)** Explain the following methods of image enhancement in spatial domain **(6)**

1) Image Negative
2) Gamma Correction

b) Explain image filtering process using window technique. What are order statistic filters and where they are used? **(4)**

OR

Q.4) **a)** Explain how the Laplacian mask is designed? Comment on the resultant image after applying Laplacian? **(6)**

OR

b) Apply DFT to the following image and prove that this DFT works. **(4)**

$$A = \begin{bmatrix} 4 & 0 \\ 0 & 0 \end{bmatrix}$$