Exam Date & Time: 29-Sep-2020 (02:00 PM - 05:45 PM)

PSG COLLEGE OF ARTS AND SCIENCE

Note: Writing 3hrs: Checking & Inserting Image : 30mins

MSc DEGREE EXAMINATION MAY 2020
(Fourth Semester)

Branch - APPLIED ELECTRONICS
DISCIPLINE SPECIFIC ELECTIVE - II - DIGITAL IMAGE PROCESSING [18ELP24B]

Marks: 75   **Duration: 210 mins.**

SECTION A

Answer all the questions.

1)   The innermost membrane of the eye is
          (i) Choroid
          (ii) retina
          (iii) sclera   (1)
          (iv) cornea

2)   In YIQ color model, Y corresponds to
          (i) Yellow
          (ii) Luminance
          (iii) Intensity   (1)
          (iv) none

3)   Histogram is a plot of
          (i) L Versus nR
          (ii) L versus rR
          (iii) pr(nR) versus rR   (1)
          (iv) pr(rR) versus rR

4)   In smoothing filters, noise reduction can be accomplished by
          (i) blurring with a non- linear filter
          (ii) blurring with a linear filter
          (iii) Image subtraction   (1)
          (iv) none

5)   The discontinuities in a digital image may exist in the form of
          (i) points
          (ii) lines
          (iii) edges   (1)
          (iv) all the above

6)   Which one of the following approaches is employed in region – Oriented   (1)
          segmentation?.
          (i) Pixel Aggregation
          (ii) Color compression

(iii) Bit- plane decomposition
(iv) Boundary extraction

7)   Chain codes are used to represent
       (i) boundary
       (ii) noise level
       (iii) pattern
       (iv) none   (1)

8)   Topology is the study of properties of a figure that are unaffected by any
       (i) domain
       (ii)deformation
       (iii) gray levels
       (iv) skeleton   (1)

9)   Decomposing a multilevel image into a series of binary images is a techniques used in
       _____ coding.
       (i) Lossy predictive
       (ii) Lossless predictive
       (iii) Bit - plane   (1)
       (iv) all the above

10)   Which type of redundancy can be identified in digital image compression?.
       (i) coding
       (ii) interpixel
       (iii) psycho- visual
       (iv) all the above   (1)

SECTION B

Answer all the questions.

11)   Describe the fundamental steps involved in digital image processing with a block
       diagram.

   a)   (7)

   [OR]
   b)   Explain discrete cosine transform method and draw the basis functions for $N= 4$.
                                                                                    (7)

12)   Explain Histogram equalization technique.

   a)   (7)

   [OR]
   b)   Describe any two sharpening spatial filtering methods.
                                                                                    (7)

13)   Describe wiener filter technique in image restoration.

   a)   (7)

   [OR]
   b)   Explain the procedure of region growing by pixel aggregation in image segmentation.
                                                                                    (7)

14)   Explain Fourier descriptors and list the basic properties of Fourier descriptors.
                                                                                    (7)

a)

[OR]   Discuss about "Recognition bases on matching"   (7)
b)

15)   Explain the following fundamental redundancies identified in image compression. (i)
         Coding redundancy (ii) Psycho visual redundancy.   (7)

a)

[OR]   Describe the lossless predictive coding model in image compression.   (7)
b)

SECTION C

Answer 3 out of 5 questions.

16)   Describe the structure of human eye and explain the image formation in the eye.   (10)

17)   Discuss in detail, the sharpening frequency domain (low pass) filtering techniques.   (10)

18)   Give a detailed account on " Detection of Discontinuities" in image segmentation.   (10)

19)   Explain the following boundary representation approaches. (i) Chain codes (ii)
         Signatures   (10)

20)   Describe the Bit – Plane coding model for image compression.   (10)

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