Reg. No. :

Question Paper Code:U2917

M.E. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Communication Systems

21PCM517- MEDICAL IMAGING TECHNIQUES

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Consider the abdomen ultrasound image that has been given as   CO5- Ana   (20)
         input image. Assume that it contains salt and pepper noise.
         Analyze the results of following filters.
         a) Mean filter b) Median filter c) Wiener filter and give suggestion
         that which filter provides maximum PSNR.

                                    Or

    (b) Compare the performance of different scanning modes of   CO5- Ana   (20)
         ultrasound imaging and analyze applications of each mode for
         various applications.

2. (a) Write the principle of 2D image reconstruction. Explain any one   CO2- App   (20)
         method along with applications of tomography.

                                    Or

    (b)   Show that RMS error decreases monotonically using an iterative   CO2- App   (20)
          reconstruction method for the 9 point object given below.

1	2	3
8	9	4
7	6	5

3. (a) Compute image formed at the image plane where an object is placed at f(6,8) at a distance of 20m from origin with an angle of 90^0.   CO2- App   (20)

<div align="center">Or</div>

    (b) Consider the MRI brain image that has been given as input image. Assume that it contains Gaussian noise. Apply the following filters for removing the specific noise a) Mean filter b) Median filter c) Wiener filter and identify which filter provides maximum PSNR   CO2- App   (20)

4. (a) Analyze various automated image processing tools for quantitative SPECT and PET Scans   CO5- Ana   (20)

<div align="center">Or</div>

    (b) Analyze why isotopic imaging is used in medical applications and justify why it is preferred in that application compared with other modalities.   CO5- Ana   (20)

5. (a) Derive the relationship between objects and an image.   CO1- U   (20)

<div align="center">Or</div>

    (b) How image restoration can be performed? And explain its various techniques.   CO1- U   (20)

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