2014-15  
B.TECH. (AUTUMN SEMESTER) EXAMINATION  
COMPUTER ENGINEERING  
IMAGE PROCESSING  
CO432

Maximum Marks: 60  
Credits: 04  
Duration: Three Hours

Answer all the questions.  
Assume suitable data if missing.  
Notations used have their usual meaning.

Q.No.  
Question  
M.M.

1(a)  
Give the mathematical model of digital images and also define neighbour of a pixel.  
[06]

1(b)  
What are fundamental steps of digital image processing?  
[06]

2(a)  
Gray level histogram of an image is given below:

<table>
<thead>
<tr>
<th>Gray Level</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>450</td>
<td>800</td>
<td>1500</td>
<td>2500</td>
<td>3100</td>
<td>1450</td>
<td>500</td>
<td>0</td>
</tr>
</tbody>
</table>

Compute the histogram of the output image obtained by enhancing the input by the 
histogram equalization technique.  
[06]

2(b)  
Explain gray level slicing and contrast stretching.  
[06]

OR

2'(a)  
Describe different techniques of multi resolution analysis  
[06]

2'(b)  
Explain how smoothing is done in frequency domain.  
[06]

3(a)  
How is wiener filtering helpful in reducing the mean square error?  
[06]

3(b)  
Write a short note on importance of data redundancy in image compression.  
[06]

OR

3'(a)  
How is image enhancement done using logical operations?  
[06]

3'(b)  
What is image blur? How it can be removed?  
[06]

4(a)  
How do you link edge pixels through global processing?  
[06]

4(b)  
Describe region based segmentation and region growing with example.  
[06]

5(a)  
Define chain codes. Explain different types of polygonal approximation techniques.  
[06]

5(b)  
Write a short note on colour image segmentation.  
[06]
2014-15
B.TECH (AUTUMN SEMESTER) EXAMINATION
COMPUTER ENGINEERING
MULTIMEDIA TECHNOLOGY
CO-450

Maximum Marks: 60
Credits: 04
Duration: Three Hours

Answer all the questions.
Assume suitable data if missing.
Notations used have their usual meaning.

Q.No. Question

1 Attempt any three:

   a) Illustrate and differentiate between hypermedia and multimedia. Give an example of each system.
   b) Briefly explain characteristic and key issue of multimedia system.
   c) What is Photosite? Explain its working in camera and scanner.
   d) Explain multimedia system and its components.

2(a) Differentiate between

   i. Lossy Compression and Lossless Compression
   ii. Entropy Encoding and Source Encoding

2(b) Encode the following stream of characters using Dynamic Huffman Encoding algorithm: MULTIMEDIA.

OR

2(b') Encode the following stream of characters using Arithmetic Encoding algorithm: MULTIMEDIA (assume all alpha-numerals (0-9, A-Z) as likely probable).

2(c) Briefly explain any one

   a) Run Length Encoding algorithm.
   b) Lempel Ziv Welch Coding

3 Describe any three:

   a) Perceptual Coding Technique in audio.
   b) Linear Predictive Coding
   c) DPCM (Differential Pulse Code Modulation) in audio.
   d) Adaptive DPCM.
4. Explain different type of frames and then explain their encoding and decoding techniques using suitable block diagrams.

OR

4'(a) Describe different Video compression principles with suitable diagram.

4'(b) What are Motion Compensation (MC) and Motion Estimation (ME) in video compression?
Maximum Marks: 60

Credits: 04

Duration: Three Hours

Answer all the questions. Assume suitable data if missing. Notations used have their usual meaning.

Q.No.  Question                                      M.M.
1(a)  Give a comparison of mobile communication systems (mobile station and base station) for TV remote control, garage door opener, paging system, cordless phone and cellular phone. Parameters to be compared are coverage range, required infrastructure, complexity, hardware cost, carrier frequency and functionality.  [08]
1(b)  Write down the key specifications of leading 2G technologies in a tabular format for CDMA1x, IS-95, GSM, DCS-1900, NADC, IS-54/IS-136 and PDC.  [07]

OR

1(b') List the various major mobile radio standards for Europe and Japan describing the type of technology, year of introduction, multiple access, frequency band, modulation and channel bandwidth.  [07]

2(a)  What were the main objectives for 1G, 2G and 3G mobile communication standards? What are the operating frequencies for CDMA? Draw the diagram for CDMA transmission and explain in detail.  [08]

2(b)  How does Roaming function in a Mobile Cellular Network? What is Roaming Management? What do the terms HLR and VLR stand for?  [07]

OR

2(b') What is a handoff? Differentiate between soft-handoff and hard-handoff. Also, what is the difference between horizontal-handoff and vertical-handoff? Explain with the help of examples.  [07]

3(a)  What is Mobile Number Portability (MNP)? Explain the Signalling Relay Approach (SRA) to MNP. Draw suitable diagrams to support your answer.  [08]

3(b)  What is Cellular Digital Packet Access (CDPD)? Explain with the help of a suitable network diagram.  [07]

OR

3(b') Explain in detail the SMS network architecture for GSM technology. Support your answer with suitable network diagrams.  [07]


4(b)  Explain the circuit switched fallback mechanism (CSPB).  [07]

OR

4(b') Explain the DoCoMo W-CDMA trial system. Draw suitable network diagrams.  [07]