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B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025
Electronics and Communication Engineering
8EC5-12 Digital Image and Video Processing

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt All Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. What is image quantization and how does it affect quality?
2. What are the basic pixel relationships in an image?
3. Why is histogram equalization useful in image enhancement?
4. What is the difference between linear and order-statistics filters?
5. What are the main color models in image processing?
6. What are the steps in region based segmentation?
7. What is wavelet transform in image processing?
8. What is inter pixel redundancy in compression?
9. What is motion estimation in video coding?
10. What are the types of shot boundary detection?

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Discuss how histogram equalization enhances a low contrast grayscale image and explain it with an example.
2. Explain a simple low-pass filter for image smoothing and its working using a 3×3 kernel example.
3. What is the significance of the HSI color model in color processing, and how do you convert an RGB image to HSI?
4. Discuss the application of the Sobel operator for edge detection and explain how it works.
5. Explain the differences between JPEG and JPEG 2000 in terms of compression efficiency and application areas.
6. Discuss inter-frame redundancy in video coding and its impact on compression.
7. Explain the difference between hard-cuts and soft-cuts in temporal segmentation.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Explain the two-dimensional Discrete Fourier Transform and its inverse. Illustrate how it is used in frequency domain filtering.
2. Discuss various motion estimation techniques in video coding. Compare full search and fast search strategies with suitable examples.
3. Discuss an image segmentation system using adaptive thresholding and region-growing methods, explaining their advantages and limitations.
4. Explain the concept of wavelets and multi-resolution analysis in image processing. How do wavelets help in image compression?
5. Describe the structure of a video encoder and decoder. Explain the significance of I, P, and B frames in video compression.

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B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025**Open Elective-II****8AG6 - 60.1 Energy Management****Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates:**

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A**(Answer should be given up to 25 words only)****All questions are compulsory.****(10×2=20)**

1. Define Energy.
2. What is Energy Management?
3. What do you mean by Commercial Energy?
4. Explain Energy Integration.
5. Energy Audit.
6. Discuss energy resources.
7. What are different energy sectors?
8. Describe energy pricing.
9. Write about LOW Grade Energy.
10. Explain Renewable Energy.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. List the primary and secondary energy sources. Also discuss the energy scenario of India.
2. Define energy conservation, mention its importance and describe energy conservation Act - 2001.
3. List the key instruments for energy audit and explain its functions.
4. Explain in detail about "Concept of Green Buildings".
5. Discuss the Cleaner energy sources.
6. Describe the energy demand management.
7. Explain energy forecasting techniques.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Explain different types of energy audit. Discuss in detail of about all three phases of energy audit.
2. Write an essay on "Energy for sustainable Development".
3. Explain different sources of Renewable energy also give its applications in different sectors.
4. Discuss the importance of energy Management Information system (EMIS) to implement an Energy Management Programme.
5. How the energy conservation can be made in the refrigeration and air condition based systems? Discuss in detail.