Program: BE Instrumentation Engineering

Curriculum Scheme: Revised 2016

Examination: Final Year Semester VII

Course Code: ISDLO7031 Course Name: Image Processing

Time: 1hour Max. Marks: 50

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Note to the students: - All Questions are compulsory and carry equal marks.

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| Q1. | What is the effect caused by the use of an insufficient number of gray levels in smooth areas of a digital image called? |
| Option A: | Image Enhancement |
| Option B: | Checkerboard Effect |
| Option C: | Quantization |
| Option D: | False Contouring |
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| Q2. | What is the storage requirement (no. of bits) of a 512X512, 16 level gray scale image? |
| Option A: | 98,304 |
| Option B: | 3,145,728 |
| Option C: | 1,048,576 |
| Option D: | 1,310,720 |
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| Q3. | Consider two pixels p and q whose coordinates are (0, 0) and (6, 3). What would be the D8 distance between p and q? |
| Option A: | 6 |
| Option B: | 3 |
| Option C: | 9 |
| Option D: | 18 |
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| Q4. | Two pixels *p* and *q* with values from *V* are m-adjacent if |
| Option A: | *q* is in *N4*(*p*) only |
| Option B: | *q* is in *ND*(*p*) and the set *N4*(*p*) ∩ *N4*(*q*) has no pixel whose values are from V (no intersection) only |
| Option C: | *q* is in *N4*(*p*) or  *q* is in *ND*(*p*) and the set *N4*(*p*) ∩ *N4*(*q*) has no pixel whose values are from V |
| Option D: | *q* is in *N4*(*p*) or  *q* is in *ND*(*p*) and the set *N4*(*p*) ∩ *N4*(*q*) has pixels whose values are from V |
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| Q5. | If matrix A is orthogonal matrix, then which of the following is true? |
| Option A: | A\*T = A-1 |
| Option B: | AAT=I |
| Option C: | y=Ax |
| Option D: | AA\*T=I |
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| Q6. | Which of the following is the widely used linear transform in data compression to reduce the high memory and bandwidth requirement? |
| Option A: | Discrete Cosine Transform |
| Option B: | Discrete Sine Transform |
| Option C: | Hartley Transform |
| Option D: | Walsh Hadamard Transform |
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| Q7. | Compute discrete Walsh Transform of the data sequence [1,2,0,3]T |
| Option A: | {1, -1, 0, √2} |
| Option B: | [1,2,0,3]T |
| Option C: | [6,0,2, -4]T |
| Option D: | {6,0, -2,0} |
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| Q8. | Which filter is more effective in removing salt and paper noise from the digital images? |
| Option A: | Median Filter |
| Option B: | Averaging Filter |
| Option C: | Wiener Filter |
| Option D: | High Pass Filter |
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| Q9. | Find the negative of the digital image with 8-gray levels and given by the matrix  f (x, y) = [1 3 5; 4 4 3; 5 2 2] |
| Option A: | g (x, y) = [7 5 3; 4 4 5; 3 6 6] |
| Option B: | g (x, y) = [5 3 2; 2 2 3; 1 4 4] |
| Option C: | g (x, y) = [2 4 6; 5 5 4; 6 3 3] |
| Option D: | g (x, y) = [6 4 2; 3 3 4; 2 5 5] |
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| Q10. | Which piecewise linear transformation highlights the contribution made to total image appearance by specific beats instead of highlighting gray level ranges? |
| Option A: | Power Law Transformation |
| Option B: | Contrast Stretching |
| Option C: | Bit Plane Slicing |
| Option D: | Gray Level Slicing |
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| Q11. | What is the difference between Histogram Equalization and Histogram Matching? |
| Option A: | Histogram Equalization is to produce an output image that has low contrast histogram, Histogram Matching is to take an input image and generate an output image that is based upon the shape of a reference histogram |
| Option B: | Histogram Equalization is to produce an output image that has a flattened histogram, Histogram Matching is to take an input image and generate an output image that is based upon the shape of a reference histogram |
| Option C: | No difference, both methods generate same result |
| Option D: | Histogram Equalization is to produce an output image that has a flattened histogram, Histogram Matching is to take an input image and generate an output image that is not based on the shape of a reference histogram |
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| Q12. | Which of the following Arithmetic/Logic Operation is suitable for removing noise from the digital images? |
| Option A: | NOT Logic Operator |
| Option B: | OR Logic Operator |
| Option C: | Image Subtraction |
| Option D: | Image Averaging |
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| Q13. | The second order derivative of the digital image can be obtained through which of the following operators. Select correct operator. |
| Option A: | The Elliptic Operator |
| Option B: | The Laplacian Operator |
| Option C: | The Difference Operator |
| Option D: | The Gradient Operator |
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| Q14. | Dilation followed by erosion is called as |
| Option A: | Closing |
| Option B: | Opening |
| Option C: | Translation |
| Option D: | Blurring |
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| Q15. | Which factor the reflection and the translation of the image objects are based on? |
| Option A: | Coordinates |
| Option B: | Pixels |
| Option C: | Frames |
| Option D: | Structuring Element |
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| Q16. | Hit-or-miss transform is used for shape |
| Option A: | Detection |
| Option B: | Decompression |
| Option C: | Removal |
| Option D: | Compression |
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| Q17. | What would be the value of second derivative approximation along the ramp? |
| Option A: | Nonzero |
| Option B: | Negative |
| Option C: | Positive |
| Option D: | Zero |
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| Q18. | Which mask out of the following should be used for finding Horizontal Line? |
| Option A: | [-1 2 -1; -1 2 -1; -1 2 -1] |
| Option B: | [2 -1 -1; -1 2 -1; -1 -1 2] |
| Option C: | [-1 -1 -1; 2 2 2; -1 -1 -1] |
| Option D: | [-1 -1 2; -1 2 -1; 2 -1 -1] |
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| Q19. | A gradient operator for edge detection is |
| Option A: | Roberts |
| Option B: | Second order derivative |
| Option C: | Zero crossing operator |
| Option D: | Median |
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| Q20. | Which of the following methods is not used for Image Compression? |
| Option A: | Discrete Cosine Transform |
| Option B: | Discrete Fourier Transform |
| Option C: | Walsh Hadamard Transform |
| Option D: | Discrete Sine Transform |
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| Q21. | What would be the Run Length Code for compressing following string?  00000111110010000101 |
| Option A: | (0,4) (1,4) (0,1) (1,0) (0,3) (1,0) (0,0) (1,0) |
| Option B: | (0,5) (1,5) (0,2) (1,1) (0,4) (1,1) (0,1) (1,1) |
| Option C: | (0,6) (1,6) (0,3) (1,2) (0,5) (1,2) (0,2) (1,2) |
| Option D: | (0,0.5) (1,0.5) (0,0.2) (1,0.1) (0,0.4) (1,0.1) (0,0.1) (1,0.1) |
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| Q22. | Which of the following redundancy should not be removed in case lossless compression is required? |
| Option A: | Coding Redundancy |
| Option B: | Interpixel Redundancy |
| Option C: | Psychovisual Redundancy |
| Option D: | Spatial redundancy |
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| Q23. | The basic idea behind Huffman coding is to |
| Option A: | compress data by using fewer bits to encode more frequently occurring characters |
| Option B: | expand data by using fewer bits to encode more frequently occurring characters |
| Option C: | compress data by using fewer bits to encode fewer frequently occurring characters |
| Option D: | compress data by using more bits to encode more frequently occurring characters |
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| Q24. | In Wiener filtering it is assumed that the noise and the image are |
| Option A: | Uncorrelated |
| Option B: | Correlated |
| Option C: | Different |
| Option D: | Homogenous |
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| Q25. | The approach to restoration is |
| Option A: | Inverse filtering |
| Option B: | Black filtering |
| Option C: | Ranking |
| Option D: | Spike filtering |