Total No. of Questions : 8]

SEAT No. :

PE2402

[Total No. of Pages : 2

[6584]-342
B.E. (Robotics and Automation)
MACHINE VISION SYSTEM
(2019 Pattern) (Semester - VII) (411501)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer all questions.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) For the below given 5×4 image find out following: **[10]**

Image :

1	2	3	3	6
6	5	7	7	2
0	0	1	5	1
2	0	1	0	0

i) Probability Density Function (PDF) of each pixel value.

ii) Huffman's Code for each pixel value.

What is the Huffman's code length for highest & lowest probability for pixel and why? Justify your answer.

b) What do you understand by the term image restoration and explain band pass and band reject filters with relevant graphs. **[8]**

OR

Q2) a) Write a short note on wavelet coding technique for lossy compression. **[8]**

b) Below is the 5×5 binary image. **[10]**

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Image :

0	0	1	1	1
1	1	1	0	0
0	0	1	1	1
1	0	1	1	0
0	1	0	0	1

For the given image calculate following

i) Total number of Run length vectors.

ii) Compression ratio.

iii) Predict if data is compressed? Justify your answer.

Q3) a) What do you understand by term clustering in image segmentation? Explain in detail with considering examples. **[9]**

b) Write a short note on boundary-based segmentation technique in detail. **[9]**

OR

Q4) a) How is the image segmented with technique-based approach? And explain structural technique in detail. **[9]**

b) Write a short note on shape based image segmentation. **[9]**

Q5) a) What is rotation & scale motion estimation technique explain with relevant example. **[9]**

b) Write a note on windowed correlation in motion estimation technique (expression is mandatory). **[8]**

OR

Q6) a) Explain in detail parametric motion estimation. **[9]**

b) Write a short note on incremental refinement and parametric motion. **[8]**

Q7) a) What are convolutional neural networks explain how it is feasible to use in robotics applications. **[9]**

b) Explain supervised learning algorithm and explain in detail. **[8]**

OR

Q8) a) Explain in detail unsupervised learning and explain in detail. **[9]**

b) What do you understand by Principle Component Analysis (PCA)? Explain in detail. **[8]**

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