UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Programme: B.Tech GIE | **Semester – VI**
Course Name: Digital Image Processing | **Max. Marks : 100**
Course Code: GIEG321 | **Duration : 3 Hrs**
No. of page/s: 2

Section-A

Answer all questions **[4X7.5=30]**

1. Compare the Lossy compression vs Lossless compression [7.5]
2. The original image is single band 8 bit data of 256x256 pixels having file size of 65,536 bytes. After compression the image size is 6,554 bytes. Evaluate the data redundancy in image file. [7.5]
3. Evaluate the merits/demerits of frequency domain filters in satellite data image processing. [7.5]
4. List out the role of sampling and quantization techniques in image data compression [7.5]

Section – B

Answer all questions **[3X15=45]**

5. Demonstrate any three key image processing algorithms being used by Geo-Informatics Engineers in sub-surface resource mapping with suitable example. 15]
6. Evaluate the algorithms for various spatial and statistical filtering [15]

OR

Demonstrate the various steps involve in Resolution merge and RGB to IHS conversion [15]

7. Calculate the first order and various second order entropy measurements (H) of the pixels block [15]

21	21	21	95	169	243	243	243
21	21	21	95	169	243	243	243
21	21	21	95	169	243	243	243
21	21	21	95	169	243	243	243

Section – C

Answer all questions **[1X25=25]**

8. Evaluate in detail on various steps of frequency domain processing of digital imagery using Fast Fourier Transformation (FFT). How FFT can be useful for geoscientific community? [20+5]

OR

An imagery is having 6 grey levels values namely a1, a2, a3, a4, a5 and a6 with their probabilities of 0.3, 0.2, 0.1, 0.1, 0.2, 0.1. Generate a Huffman coding for these grey levels. Imagery having two grey level symbol A & B with their probability given as P(A) =0.4 and P(B)= 0.6 being encoded of symbol code length of 4 with arithmetic code of 0.762. Decode the arithmetic code (0.762) to find out the correct sequence of symbol. [12+13]

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