

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December-2018

B.Tech VII Semester

COURSE CODE: 18B1WEC734

MAX. MARKS:35

COURSE NAME: MEDICAL IMAGE PROCESSING

COURSE CREDITS: 3

MAX. TIME: Two Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. (a) Evaluate the average image obtained by implementing 3X3 average filter on the image I given below: [3] CO2

I =

0	1	2	3	3
1	0	1	2	3
2	1	0	1	0
3	1	0	0	1
2	1	0	0	1

- (b) With the help of `fspecial` and `imfilter` inbuilt functions, write a MATLAB code to implement an average filter of size 9X9 on any image. [2]CO2
- (c) **Without using** `fspecial` and `imfilter` inbuilt functions, write a MATLAB code to implement an average filter of size 9X9 on any image. [2] CO2
2. (a) Explain the similarity and difference between the imaging capturing mechanism of normal camera and medical imaging modalities. [4] CO1
- (b) On the basis of physics involved, briefly explain the differences between the following imaging modalities: (i) MRI (ii) CT (iii) Ultrasound [3] CO1
3. (a) What do you understand by texture of any object in an image? [2] CO3
- (b) How First order statistics are different from second order statistics like GLCM? [1] CO3
- (c) Explain the physical interpretation of any four first order statistics. Evaluate them for the image I given in Q1(a). [4] CO3

4. For the image I given below, find the normalized GLCM considering NE pixel pairs and a distance of 1 pixel between them. Also evaluate contrast, ASM and IDM for the GLCM obtained. [4+3=7] CO3

I =

0	1	2	3	3	0
1	2	3	3	0	1
2	3	3	0	1	2
3	3	0	1	2	3
3	0	1	2	3	1
0	1	2	3	1	1

5. (a) Draw and explain the Computer Aided Diagnosis (CAD) system for analyzing the medical images. [4] CO4
- (b) Explain the following terms:
- (i) Supervised Learning
 - (ii) Un- Supervised Learning
 - (iii) Learning Rate [3] CO4