ROLL NO:	

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. Tuesday 25th September, 2018

TEST –1

Odd Semester 2018-19 Course: **ECE 307 Digital Image Processing** V Sem. ECE

Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A

(3 Q x 2 M = 6 Marks)

1. Speech signal has a bandwidth of 4Kz. If every sample is digitized using 8-bits and the digital speech is to be transmitted over a communication channel, calculate the minimum bandwidth requirement of the channel?

2. An image segment is shown below, let V be the set of gray level values used to define connectivity in the image. Calculate the Euclidean Distance (De), City-block Distance (D4) and Chessboard distance (D8) and D_m distances between pixel 'P' and 'Q' for V=[2, 3].

P→	[2]	3	2	6	1
	6	2	3	6	2
	5	3	2	3	5
	2	4	3	5	2
	4	5	2	3	[6] →Q

3. A camera lens has a focal length of 5. Identify the image point corresponding to a world point at location (50, 70, 100). Assume the image co-ordinate system and the world co-ordinate system to be perfectly aligned.

Part B

(1 Q x 6 M = 6 Marks)

4. With neat figure and mathematical expressions, describe the basic mathematical transformations: Translation, Rotation and Scaling in 2D.

Part C

(1 Q x 8 M= 8 Marks)

5. With a neat block diagram describe in detail the fundamental steps involved in digital image processing.

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TEST 2

Odd Semester: 2018-19 | **Date**: 28 November 2018

Course Code: ECE 307 | **Time**: 1 Hour

Course Name: Digital Image Processing | **Max Marks**: 20

Branch & Sem: ECE & V Sem | **Weightage**: 20%

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **four** marks. (3x2=6)

1. Explain Orthogonal and Orthonormal basis vector.
2. Explain the three important properties of interpolation.
3. State separability property of 2D-DFT with relevant equation.

Part B

Answer **all** the Questions. **Each** question carries **four** marks. (1x6=6)

4. Consider a grayscale image in a matrix 4x4 form given below,

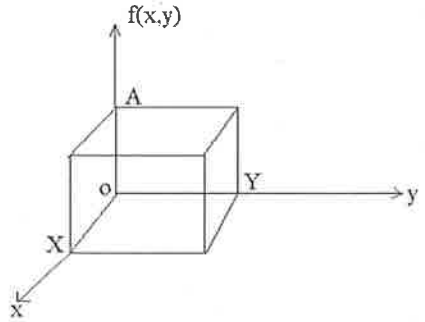
[3 2 4 5; 7 7 8 2; 3 1 2 3; 5 4 6 7]

where the intensity of the pixels vary between 1 to 8. Perform the histogram equalization on this image and scale the intensity to 1 to 20.

Part C

Answer **all** the Questions. **Each** question carries **four** marks. (1x8=8)

5. Derive the Fourier Transformation equation of a continuous function f(x,y) as shown in fig below



Roll No.											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF MANAGEMENT

END TERM FINAL EXAMINATION

Odd Semester: 2018-19 | **Date**: 29 December 2018

Course Code: ECE 307 | **Time**: 2 Hours

Course Name: Digital Image Processing | **Max Marks**: 40

Programme & Sem: ECE & V Sem | **Weightage**: 40%

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **both** the Questions. **Each** question carries **five** marks. (2Qx5M=10)

1. Define run length coding. Use run length coding for compressing string A which is given as 00000111110010000101.
2. Explain with a neat figure HSI Color Model used in color image processing.

Part B

Answer **both** the Questions. **Each** question carries **ten** marks. (2Qx10M=20)

3. Derive the expression for observed image when the degradation is linear, position-invariant.
4. Explain the pseudo color image processing with a neat functional block diagram.

Part C

Answer the Question. Question carries **ten** marks. (1Qx10M=10)

5. Consider a source with 7 messages having the probabilities 0.21, 0.25, 0.18, 0.11, 0.14, 0.07, 0.04 . Find average code length using Huffman coding technique.