



Course Title:	Digital Image Processing	Date:	21/03/2012
Course No:	0750474	Time Allowed:	1 Hour
Lecturer:	Dr. Qadri Hamarsheh	No. Of Pages:	3

**Information for candidates**

1. This examination paper contains 6 questions totaling 20 marks
2. The marks for parts of questions are shown in round brackets.

**Advices to candidates**

1. You should attempt all questions.
2. You should write your answers clearly.

**Basic notions:** The aims of the questions in this part are to evaluate the required minimal student knowledge and skills. Answers in the pass category represent the minimum understanding of basic concepts: components of general purpose image processing system, applications of DIP, types of digital images, Categorization by Image Sources and DIP programming using MATLAB.

**Question 1 Multiple choices (circle the most appropriate one):****(4 marks)**

1. **Imaging Radar** Technology is an application of ----- band.
  - a) Radio waves
  - b) Gamma Rays
  - c) Ultra Violet
  - d) Micro Waves
2. One of the following functions is not an IPT (image processing toolbox) function used to convert images.
  - a) dither ()
  - b) rgb2gray ()
  - c) gray2rgb ()
  - d) ind2gray ()
3. The **colormap** array of the indexed image is always of class
  - a) uint8
  - b) uint16
  - c) double
  - d) logical
4. By default, Matlab stores most data in arrays of class
  - a) uint8
  - b) uint16
  - c) double
  - d) logical

**Question 2 Classify Images sources by energy****(2 marks)**

**Familiar and Unfamiliar Problems Solving:** The aim of the questions in this part is to evaluate that the student has some basic knowledge of the key aspects of the lecture material and can attempt to solve familiar and unfamiliar problems of DIP applications, types of digital images and DIP programming using MATLAB.

**Question 3** List four types of digital images used in Matlab programming language; explain the Data Classes, the range for each type and how many matrices used for each type (fill the table) (3 marks)

Image Type	Data Classes	Range	Number of matrices

**Question 4** Write a Matlab script code to (3 marks)

- Read a simple RGB image "football.jpg".
- Create a separate image for each color planes (red, green and blue) of the image.
- Display each color plane image separately, and also display the original image.

**Question 5** Write an M-function; call it "imblend" to

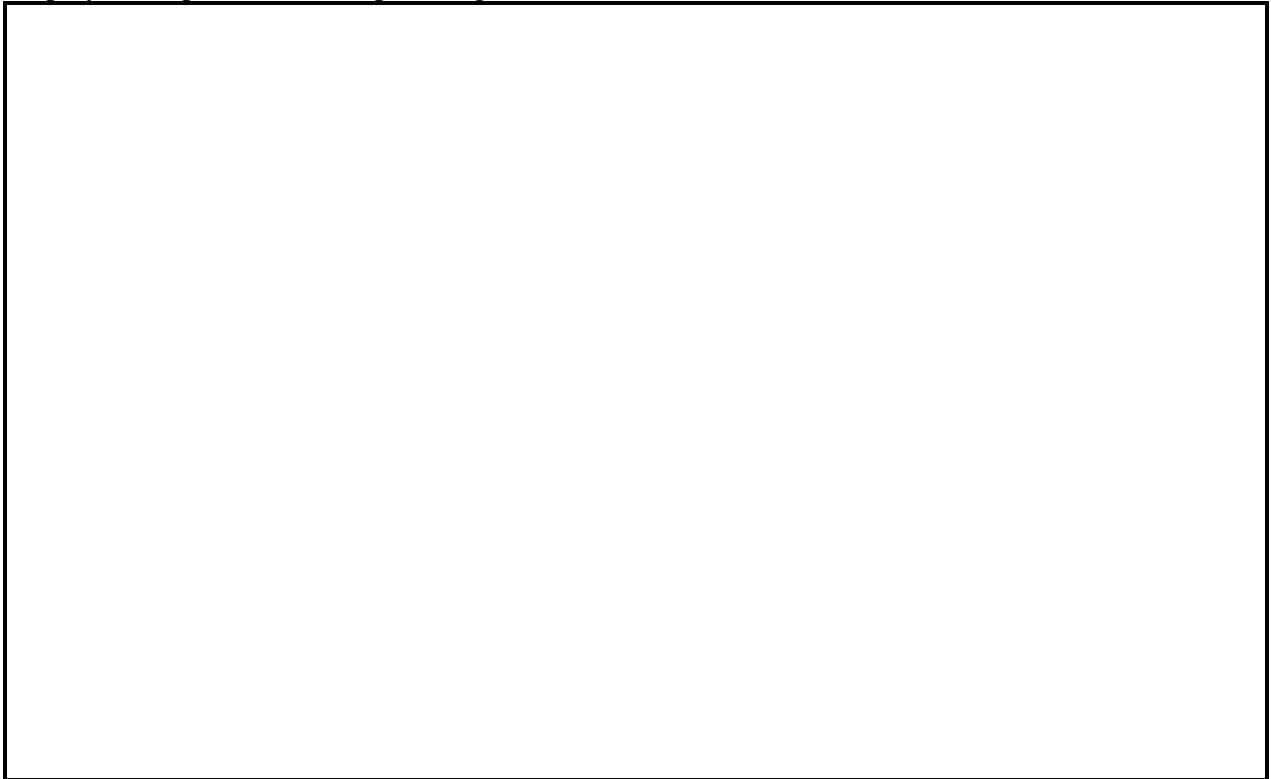
(3 marks)

- Generate a blended (mix or combine) version from two grayscale input images of the same size using the following equation:

$$q(i, j) = br \cdot g1(i, j) + (1 - br) \cdot g2(i, j)$$

Where  $br$  Blending ratio (0-1),  $q$  : output image,  $g1, g2$  : input images,

- Use **preallocating** array for image.
- Use **low-level** processing.
- Display the input and the output images.



**Question 6:**

(5 marks)

Write a matlab script code to

- Read images "cameraman.tif" and "pout.tif".
- Display both images as shown in figure
- Subtract the first 200x200 pixels of the first image from the last 200x200 of the second image.



**GOOD LUCK**