Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL

II SEMESTER MCA

END SEMESTER EXAMINATIONS, APR/MAY 2017

SUBJECT: DIGITAL IMAGE PROCESSING [MCA 5003]

REVISED CREDIT SYSTEM
(25/04/2017)

Time: 3 Hours | MAX. MARKS: 50

Instructions to Candidates:

- Answer **FIVE FULL** questions.
- Missing data may be suitably assumed.

1A. What is a Digital Image? Explain the steps required to convert into digital form with an example. **5**

1B. Consider the two image subsets, S_1 and S_2, given below.
For V={4,5}, determine whether these two subsets are:
i) 4-adjacent ii) 8-adjacent and iii) m-adjacent, justify your answer. **3**

4	3	2	0	6	0	0	0
0	0	0	5	4	0	7	7
4	0	0	4	0	0	3	5
0	0	3	0	0	0	4	0
S_1				S_2			

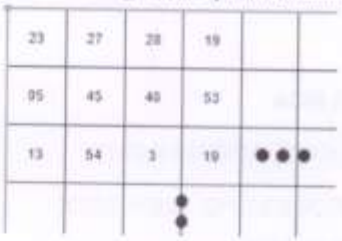
1C. Define Region and Boundary of an image. **2**

2A. What is a Histogram Equalization? Consider an image of size 64 x 64 and having 8-levels of intensity distribution shown below. Use PDF to compute and draw the equalized histogram. **5**

Grey levels(R_k)	0	1	2	3	4	5	6	7
No.of Pixels(N_k)	429	850	81	245	22	656	790	1023

2B. What is grey level slicing of an image? Can you give the transformation function, which highlights range of grey levels and reduces all others to a constant level. Mention at least one usefulness of this. **3**

2C. Why Ideal lowpass and highpass filters lead to ringing effects? **2**

3A.	Demonstrate image filtering operation using weighted averaging mask for the below given sub image in the spatial domain.  	5
3B.	What is the usefulness of Chromaticity diagram and Tri-stimulus?	3
3C.	What is the use of pesudocoloring?	2
4A.	What is image segmentation? What are the basic approaches for segmenting an image? Explain.	5
4B.	How can you convert a color specified in RGB model to HSI model?	3
4C.	What is LOG operator and what are its uses?	2
5A.	What is region splitting and merging based segmentation? Write an algorithm and explain with an example.	5
5B.	What is Morphology? What are opening and closing operations?	3
5C.	Define Convex Hull.	2