



SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology

Second Year, Second Semester Examination – 2015

IT41- Graphics and Multimedia Processing

Instructions for Candidates:

Answer **any five (5) questions**

All questions carry equal marks

No. of questions : 08

No. of pages : 04

Time : Three (03) hours

Question:01

- (i) What is an image? (02 Marks)
 - (ii) Explain the difference between analog and digital images. (06 Marks)
 - (iii) Define terms “sampling” and “quantization” with reference to digital images. (06 Marks)
 - (iv) How is the color system **HSV** constructed? (03 Marks)
 - (v) Explain how a color image can be stored in the computer memory. (03 Marks)
- (Total 20 marks)**

Question: 02

- (i) Define following properties of video display devices. (04 Marks)
 - a) Aspect ratio
 - b) Resolution
 - (ii) Briefly explain the terms “raster graphics” and “vector graphics”. (04 Marks)
 - (iii) Write the two (02) techniques for producing color displays with a CRT. (05 Marks)
 - (iv) What is ‘vertical retrace’ and ‘horizontal retrace’ of the electron beam?(04 Marks)
 - (v) Explain the difference between raster scan display and vector scan display. (03 Marks)
- (Total 20 marks)**

Question: 03

- (i) Define 4, 8 & m adjacency. (06 Marks)
- (ii) Explain the significance of connectivity analysis between pixels. (03 Marks)
- (iii) Define the connectivity between two pixels. (03 Marks)
- (iv) Following table shows the data extracted from a digital image

0	0	0	0	0	0	0
0	1	1	0	0	0	0
0	1	1	0	0	0	0
0	0	0	1	1	1	0
0	0	0	1	1	1	0
0	0	0	0	0	0	0

- a) If $V = \{1\}$, how many connected components can be identified in this image by considering 4 adjacency. (03 Marks)
- b) Get the output matrix after applying connected component labeling. (05 Marks)

(Total 20 marks)

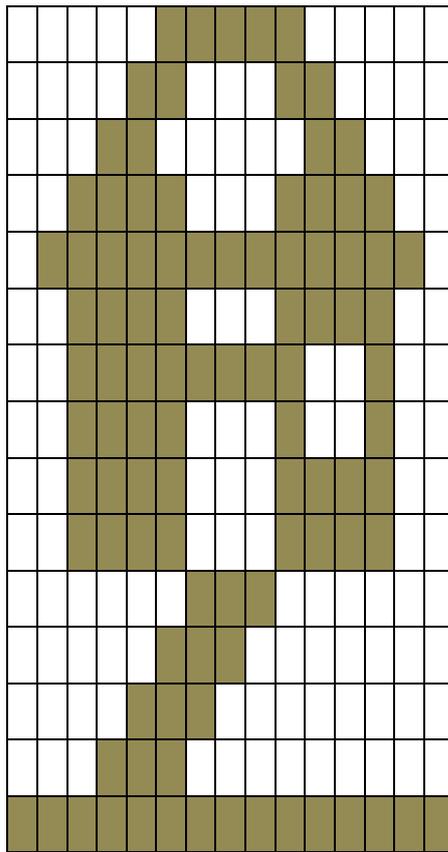
Question: 04

- (i) Define the term 'Computer graphics'. (03 Marks)
- (ii)
 - a. What is digital image processing? (02 Marks)
 - b. List down three (03) basic application areas of digital image processing. (03 Marks)
- (iii) Explain the benefits of graphics applications considering three (3) areas. (08 Marks)
- (iv) What is the histogram of an image? Explain briefly. (04 Marks)

(Total 20 marks)

Question: 05

- (i) What is image compression? (02 marks)
- (ii) List two (02) advantages and two (02) disadvantages of image compression. (04 marks)
- (iii) Explain the terms 'image encoding' and 'image decoding'. (06 marks)
- (iv) Encode the following image using 'run length coding' method (08 marks)



(Total 20 marks)

Question: 06

- (i) What are the major steps involved in multimedia application development process from planning to publishing? (05 marks)
- (ii) “Target audience is a key requirement of multimedia application development”. Explain this statement giving relevant facts. (06 marks)
- (iii) List out three (03) components of a multimedia system. (03 marks)
- (iv) Write short notes about following team members. (06 marks)
 - a) Content specialist
 - b) Multimedia architect

(Total 20 marks)

Question: 07

- (i) List out four (04) image file formats. (04 marks)
- (ii) Which are the two (02) basic redundancies that can be identified in digital images? (02 marks)
- (iii) Define the following terms. (09 marks)
 - a) Compression Ratio
 - b) Image quality
 - c) Data Redundancy
- (iv) Explain the difference between Lossy and Lossless compression techniques. (05 marks)

(Total 20 marks)

Question: 08

- (i) What is an animation? (04 Marks)
- (ii) State and explain two (02) types of animation techniques. (04 marks)
- (iii) Explain the relationship between frame rate and quality of an animation. (04 marks)
- (iv) Explain at least four (04) facts that can be used to increase the realistic effect of an animation. (08 marks)

(Total 20 marks)