

AMIETE – IT (NEW SCHEME) - Code: AT65

Subject: MULTIMEDIA SYSTEMS

Time: 3 Hours

Max. Marks: 100

DECEMBER 2010

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after half an hour of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

- a. ----- is a multimedia authoring tool.
- (A) Quest (B) Maya
(C) Final Cut Pro (D) Cubase
- b. In Macromedia flash, ----- tweening allows to create a shape that continuously changes to a different shape over time
- (A) Time (B) Shape
(C) Video (D) Movement
- c. This strategy is to replace a pixel value by a larger pattern, such that the number of printed dots approximates the varying disks of ink.
- (A) High resolution printing (B) Low resolution printing
(C) Halftone printing (D) Partial tone printing
- d. This method is to calculate that part of the three-color mix that would be black, remove it from the color proportions, and add it back as real black.
- (A) undercolor adding (B) overcolor removal
(C) overcolor adding (D) undercolor removal
- e. The NTSC version has 525 scan lines, each having 858 pixels, and uses 4:2:2. The data rate is -----
- (A) 216Mbps (B) 216kbps
(C) 64Mbps (D) 64kbps
- f. If an image has 1/3 of dark pixels and remaining bright pixels, the entropy of the image is -----
- (A) 0.73 (B) 0.92
(C) 0.61 (D) 0.80

g. ----- transform optimally decorrelates the components of the n -dimensional vector.

- (A) DFT (B) DCT
(C) KLT (D) Haar

h. ----- scan has a good chance of concentrating long runs of zeros

- (A) raster (B) morton
(C) vertical (D) zigzag

i. This scalability of MPEG 2 facilitates higher frame rate.

- (A) Temporal (B) Spatial
(C) Motion (D) SNR

j. The important frequency peaks of an audio signal are called -----.

- (A) unvoiced (B) formants
(C) fricatives (D) voiced

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

Q.2 a. Define a multimedia system. What are main properties and components of multimedia systems? (10)

- b. Calculate the amount of storage required in bytes for the following cases: (6)
(i) 640 x 480 monochrome image
(ii) 640 x 480 8-bit gray level image
(iii) 640 x 480 24-bit color image.

Q.3 a. Explain Gamma correction with necessary diagrams. (8)

- b. Describe the following analog video formats: (8)
(i) NTSC
(ii) PAL
(iii) SECAM

Q.4 a. Describe in detail non-linear quantization of audio signals. (8)

- b. Encode CAEE\$ using arithmetic coding given the following probability distribution. A – 0.2, B – 0.1, C – 0.2, D – 0.05, E – 0.3, F – 0.05, \$ -- 0.1 (8)

Q.5 a. Given the input sequence $\{x_{n,i}\} = \{10, 13, 25, 26, 29, 21, 7, 15\}$, find a 3-level decomposition using Haar wavelet transform. (8)

-
- b. Explain with a block diagram the 3-level hierarchical JPEG encoder. (8)
- Q.6** a. Describe the H.263 video coding standard for video conferencing. (8)
- b. Explain the different profiles and levels in MPEG 2. (8)
- Q.7** a. Explain global motion compensation in object based visual coding of MPEG 4. (8)
- b. What is a vocoder? Describe CELP technique for audio compression. (8)
- Q.8** a. Explain MP3 coding technique with a block diagram. (8)
- b. Describe the following in the context of multimedia over ATM networks (8)
- (i) Video bit rates over ATM
 - (ii) MPEG 2 convergence to ATM
 - (iii) Multicast over ATM
- Q.9** a. Explain the different types of animation. (8)
- b. Mention the merits and demerits of CD over standard hard discs. Explain the working principle of a CD. (8)