

THE OPEN UNIVERSITY OF SRI LANKA
 DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
 DIPLOMA IN INFORMATION SYSTEMS AND TECHNOLOGY
 ECI3168 – GRAPHICS AND INTERACTIVE MULTIMEDIA DESIGN
 ACADEMIC YEAR 2014/2015
 FINAL EXAMINATION - PART I



(CLOSED BOOK)

Date: 04TH OCTOBER 2015

Time: 0930 – 1130 hr

Answer all the Questions

- Question 1** (25 marks)
1. List **five** media elements mainly used in multimedia. (5 marks)
 2. Explain the difference between **captured** and **synthesized** media by giving an example for each of the types. (5 marks)
 3. Classify the following media items based on their time/space nature (**Continuous** and **Discrete**) and the origin (**Captured** and **Synthesized**). (10 marks)
 - a. An animated text prepared for a presentation
 - b. A portrait, taken for preparing an ID card
 - c. A MIDI audio loop
 - d. A video clip extracted from a surveillance camera system
 - e. A vector graphic of a company logo
 4. Identify **two** major problems that may occur if it is proposed to use a multimedia application as an education supporting tool in classrooms of rural schools in Sri Lanka. Briefly explain your answer. (5 marks)

- Question 2** (25 marks)
1. Compare the following facts between vector and raster graphics. (5 marks)
 - a. File size
 - b. Processing power requirement to display
 - c. Rescaling
 - d. texture details
 - e. Smooth colour shading
 2. The quality, size and details of an image rely on several resolution measurements. (5 marks)
 - a. Briefly describe image resolution (spatial resolution) and colour resolution (colour depth).

- b. Name **one** technique that can be used to reduce the colour resolution without much affecting the perceptual visual quality.
3. A camera consists of a feature to select the internal photo storing format out of **raw** and **JPEG** after capturing. (5 marks)
- Suggest suitable image formats for the following scenarios,
 - Apply post processing for enhancing the photos
 - Directly get printouts of selected photos
 - Store in a digital photo album
 - Write a benefit and a drawback of each of the two image file formats.
4. A multimedia project requires two raster graphics with the following specifications,(10 marks)
- Graphic 1:- **Size:** 1024x780; **Colours:** 16.7 million (2^{24}) colour; **Transparency:** Multi level transparency; **Usage:** To use as an informative figure in a presentation.
 - Graphic 2:- **Size:** 640x480; **Colours:** 256 Colours; **Transparency:** either fully transparent or fully opaque; **Usage:** To use as an informative figure in a webpage.
- Suggest an image file format for each of the graphics. Justify your answer.
 - Calculate the size of each graphic in megabytes before the compression, based on your selection of file formats.

Question 3

(25 marks)

- Describe what "**persistence of vision**" means in the context of human vision system.(5 marks)
- Briefly explain how tweens are created when given two key frames. (5 marks)
- A content-rich webpage requires a small "loading" animation to display to the user until the webpage is fully loaded. Assuming that the animation should contain a 32x32 pixels sized rotating earth globe animated at 15 fps, suggest an animation type out of bitmap and vector animations. Justify your answer. (5 marks)
- An animation contains a scene of an explosion where the focus of the audience should be taken into the details of the explosion. Compare the suitability of following staging techniques on this task. (10 marks)
 - Slow motion
 - Frozen time

Question 4

(25 marks)

- 3D graphic creation typically goes under several mandatory steps. (5 marks)
 - List **three** main steps of creating a 3D graphics, with the correct order.
 - Briefly explain the difference between the first **two** steps.
- Explain why ray-tracing is not generally suitable for interactive 3D graphics. (5 marks)
- Suggest **two** methods to increase the speed of generating the final output (raster images or video) of a 3D animation. Assess your suggestions with respect to the quality and cost. (5 marks)

4. A 3D animation requires an audio clip with voice dubbing for the characters in the animation. The animation will be produced as an audio embedded video. (10 marks)
- a. Explain why stereo-channel audio is better than a mono-channel audio in this scenario.
 - b. Assume that the audio is recorded for 10 seconds in stereo channel with 16-bit per-channel resolution and 44.1 kHz of sample rate. Calculate the size of the audio.