

**THE OPEN UNIVERSITY OF SRI LANKA**  
**Faculty of Engineering Technology**  
**Department of Electrical & Computer Engineering**



**Diploma in Information Systems and Technology**

**Final Examination (2016/2017)**  
**ECI3168: Graphics and Interactive Multimedia Design**

**Date: 23<sup>rd</sup> November 2017 (Thursday)**

**Time: 9:30 am – 11:30 am**

1. *This paper contains Four (4) questions on Three (3) Pages.*
2. *The total marks obtainable for this examination is 100. The marks assigned for each question thereof are included in square brackets.*
3. *This is a **close book** examination.*
4. *You may use permitted calculators if necessary.*
5. *Answer ALL questions.*

**Q1.**

- a) List **five** forms of multimedia contents. *[5 Marks]*
- b) Followings are the facts, which can be considered in evaluating a multimedia product. Categorize them to the **user's** and **developer's perspectives** of product evaluation.

- |                   |                |
|-------------------|----------------|
| i. Content        | v. Platform    |
| ii. Performance   | vi. Delivery   |
| iii. Usability    | vii. Interface |
| iv. Cost & Effort |                |

*[10 Marks]*

- c) An automobile manufacturing company has decided to use an online multimedia application to receive orders from their customers. The company facilitates for custom-made vehicle by allowing modifying a set of interior and exterior components of the vehicles they manufactured, based on the customers' requirement. The proposed application has several modules such as news feed for marketing the new models of their vehicles, a tool for selecting the desired components to request modification for their custom-made vehicles and the product portfolio of the company. *[10 Marks]*
- i. Briefly explain **two** benefits of using an interactive multimedia application for this purpose.
  - ii. Briefly explain **two** possible barriers, which make the implementation/usage of this application difficult.

Q2.

a) Describe the following features of character layout configuration with illustrations.

[5 Marks]

- i. Tracking
- ii. Kerning
- iii. Leading
- iv. Ascender
- v. Descender

b) A **standalone** multimedia application has a text field, which accepts text with different font **sizes, colors, styles and languages**.

[10 Marks]

- i. Suggest a text file format to save the input text with preserving all the specified formatting.
- ii. Explain the consequences of using ASCII (ISO-8859-1) coding system while saving the content of this text field.

c) A library has decided to give access to their books in digital form for their readers through a **web application**. The application will display book contents through an HTML page. The following is the proposed specification for displaying the text content. Comment about the suitability of each of the followings with justifications.

- i. Text color: White, Page color: Black
- ii. Font type: Serif
- iii. Font: A font which is particularly customized for this application
- iv. Text layout with loose tracking
- v. Body text effects: Shadow

[10 Marks]

Q3.

a) Briefly describe the following measurements of multimedia elements.

[5 Marks]

- i. Aspect Ratio
- ii. Spatial Resolution
- iii. Spectral Resolution
- iv. Temporal Resolution
- v. Sample Rate

b) Give a **usage** for each of the following color schemes/spaces by giving the specific **reason** for the particular usage.

[10 Marks]

- i. RGB
- ii. CMYK
- iii. HSB/HIS
- iv. YUV
- v. CIE 1931

c) Calculate size of an uncompressed raster image with the following specification.

[10 Marks]

- 800 X 600 of dimension
- RGB colors: 8-bits per channel
- 256 levels of transparency per pixel
- Contains 8-byte file header

Q4.

- a) Explain how the **phi** phenomenon and **persistence of vision** together form the foundation for the vision of continues motion out of sequence of images. [5 Marks]
- b) Briefly explain why the compression ratio of a video is generally greater than the compression ratio of an image. [5 Marks]
- c) A Smartphone device can record a **16:9** full-high definition (**1080p**) video for **10 seconds** maximum, at the frame rate of **240fps**. The audio is recorded in **stereo** track at **44.1 kHz** of sampling frequency and **16-bit** of amplitude resolution. Then the video can be played back in slow-motion with the speed of **1/8** of the original frame rate.
- Calculate the **duration** and **frame rate** of the video when playing back in slow-motion. [5 Marks]
  - Calculate the size of a **video** recorded using the above configuration up to its maximum possible duration including the **audio** data. [10 Marks]

End of Paper