



DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY
UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR
THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
INFORMATION TECHNOLOGY

CIT 3204: MULTIMEDIA SYSTEMS

DATE: 6/12/2021

TIME: 11.00 A.M.-01.00 P.M.

Instructions: Answer Question 1 and Any Other Two.

Question ONE: (30 Marks)

- a) Explain the meaning of Multimedia. (2 marks)
- b) Analyze the three basic components of a VRML file. (3 marks)
- c) Highlight FOUR desirable characteristics of a good Multimedia Authoring System. (4 marks)
- d) A computer is to be used to add effects to analog audio signals. Identify two types of devices required for this and describe their functionalities in the processing pipeline. (4 marks)
- e) Giving relevant examples in each case differentiate between the following terms as used in multimedia applications:
 - i. Static media and Dynamic media (2 marks)
 - ii. Hypertext and Hypermedia (2 marks)
- f) Discuss any FOUR Multimedia application class/Areas other than game systems. (4 marks)
- g) The digital world of interactive TV and Video on demand wholly see analogue system employ the use of set top boxes.
 - i. Define the term “set top boxes” (1 mark)
 - ii. Highlight the main role played by the set to boxes (2 marks)
- h) Dehub has selected you to be in a team that has been tasked with the development of a multimedia system that will have various applications in the university. Describe TWO challenges the team is likely to face in in the process of carrying out its mandate. (4 marks)
- i) Explain the following terms as used in Multimedia Systems;
 - i. Streaming Media (1 mark)
 - ii. Authoring (1 mark)

Question Two: (20 Marks)

- a) Explain the following data types for graphics and image file formats.
 - i. 1-bit color images (2 marks)
 - ii. 8-bit Gray-level Images (2 marks)
 - iii. 24-bit Color Images (2 marks)
- b) Elaborate any three sound formats as used in Multimedia Systems. (3 marks)
- c) Differentiate between the two types of compression format in Multimedia Systems. (4 marks)
- d) QuickTime is the most widely used cross-platform multimedia technology available today.
 - i. Analyze any three the key features of QuickTime that have led to its adoption as an international multimedia format. (3marks)
 - ii. Explain any four types of QuickTime components. (4marks)

Question Three (20 marks)

- a) Explaining every stage involved, generate an optimal Huffman encoding tree using the string "happy hip hop" and use it to encode the string "ahoy". (7 marks)
- b) Explain the steps of producing a Multimedia application. (4 marks)
- c) MIDI is a protocol that enables computer, synthesizers, keyboards, and other musical or (even) multimedia devices to communicate with each other. Describe How is a basic MIDI message structured. (2marks)
- d) Write a program that creates a VRML world which contains a brown and a blue cone. The brown cone should be translated at some angle along the negative Y axis in order to appear exactly above the blue cone. (7marks)

Question Four (20 marks)

- a) Sampling involves measuring the quantities of an analogue signal that we are interested in at evenly space intervals.
 - i. Differentiate between the terms Sampling and Quantization. (2 marks)
 - ii. Using well labeled diagrams, differentiate between sampling an analogue signal in time dimension and amplitude dimensions. (2 marks)
 - iii. Explain the two steps involved in the sampling process. (2 marks)
 - iv. Using a sinewave, explain the Nyquist theorem as used in digital sound sampling. (2 marks)
 - v. Explain the term Aliasing and briefly discuss one effect of aliasing. (2 marks)
- b) Discuss FOUR broadcast and video standard and recording formats used in Multimedia around the world. (4 marks)
- c) Highlight in details any video formats. (2 marks)
- d) MPEG consists of a variety of different standards. These are MPEG-1, MPEG-2, MPEG-4, MPEG-7 and MPEG-21.
 - i. Discuss why such standards evolved. (2 marks)
 - ii. Give an example target application for each variant of the MPEG standard. (2 marks)