



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE BACHELOR OF
SCIENCE IN INFORMATION TECHNOLOGY

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE BACHELOR OF
SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE, BACHELOR OF SCIENCE IN
MATHEMATICS

**CIT 3303/CIT 3476: MULTIMEDIA SYSTEMS AND APPLICATIONS/MULTIMEDIA
SYSTEMS**

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- A digital recording is processed at 44.1 kHz, 16-bits, stereo. If we record for 10 min, calculate the file size in mega bytes. (4 Marks)
- Define multimedia systems and give four examples of the multimedia elements used in web applications, (4 Marks)
- The term analogue has often been used to imply that something is old or outdated while the opposite of it is digital. Provide an accurate definition of the words analogue technology and digital technology with regards to multimedia systems. (4 Marks)
- Text is the most widely used element in multimedia systems and application. Describe the digitization process for text (4 Marks)

- e) If a tree falls in the woods and there is no one nearby, does it make a sound? In order to answer this question, state the three conditions which must be met in order to define sound.
- f) Distinguish between hypertext and hypermedia (4 Marks)
- g) During the digitization process, large file will strain system resources. Give four types of system resources which are affected by large files (4 Marks)
- h) A document architecture describes the connections among the individual elements. Provide three models used to represent these connections (4 marks)
- i) State and explain the Nyquist sampling theorem (2 Marks)

QUESTION TWO (20 MARKS)

- a) The simplest signal pattern is a sine wave. Illustrate and explain three physical properties of a sine wave (4 Marks)
- b) Distinguish between digital audio vs MIDI (4 Marks)
- c) Explain three values which can be manipulated by compression algorithms in order to reduce file size (4 marks)
- d) Discuss the two boundaries between which human hearing may detect (4 Marks)
- e) Define the signal-to-noise ratio (4 marks)

QUESTION THREE (20 MARKS)

- a) Illustrate and explain the global structure of multimedia systems (4 Marks)
- b) Describe the two phenomena responsible for the visual effect of motion in video and animation (4 marks)
- c) illustrate and explain the components within a video capture card (4 Marks)
- d) distinguish between motion dynamic vs update dynamic (4 marks)
- e) Describe the processes involve in the digitization of animations (4 marks)

QUESTION FOUR (20 MARKS)

- a) Describe four measurements of text' (4 Marks)
- b) Discuss four considerations when choosing the fonts in a multimedia presentation (4 Marks)
- c) From the word MISSISSIPPI, use run length coding to compress it (4 Marks)

- d) Distinguish between lossy vs lossless compression algorithms (4 Marks)
- e) Create a binary encoding system to report four weather states between Meru and Nairobi.
From this system, provide the following: (4 Marks)
- i. A Huffman code tree
 - ii. Calculate the entropy limit

QUESTION FIVE (20 MARKS)

- a) Illustrate and explain the two primary color systems used digital multimedia systems (4 Marks)
- b) complete the colour index below: (4 marks)

RED	GREEN	BLUE	RESULT
255	255	0	?
?	?	?	CYAN
127	127	127	
0	255	255	?

- c) illustrate and explain the components of a DSLR (4 Marks)
- d) Explain the processes involve in the jpeg compression algorithm (4 Marks)
- e) Distinguish between dedicated vs time based multimedia authoring systems (4 Marks)