



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE

REGULAR PROGRAMME

CMT 418: MULTIMEDIA SYSTEMS

Date: APRIL 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

- Q1. a) Define Media Convergence. **(2 Marks)**
- b) You have been hired as a multimedia consultant by an upcoming production company for local media that is seeking to recruit personnel for a remote branch in your county. Propose 8 titles affiliated with the company's core objective and describe their roles. **(8 Marks)**
- c) List and describe using a relevant example the various classification of multimedia systems. **(10 Marks)**
- d) Calculate the minimum rate we need to sample a sound with a frequency of 880Hz. **(2 Marks)**
- e) The company you work for has applied for a broadcasting license and has been assigned the range 500KHz to 1200KHz. All broadcasts from remote branches must be cleared by the headquarters before transmission hence 200KHz has been reserved for inbound transmissions. Calculate the bandwidth available for broadcasts. **(2 Marks)**
- f) Describe the additive and subtractive color models. **(6 Marks)**

- Q2. a) “Millano Jeans”, a famous jeans company would like to add an animated advertisement banner on the Web for a jeans show. The Vice President of the company is concerned about the quality of the graphics and animation design. As the project manager, you are required to write a technical report that describes:
- i) The technical design issues faced during such projects. **(4 Marks)**
 - ii) The Font, Color Principles and video transitions in relation to the project. **(6 Marks)**
 - iii) Any 2 video transitions that you will utilize. **(2 Marks)**
- b) The company also has a theme song for the jeans brand. Suppose they want to market the brand to remote areas via radio. Explain the transmission process involved using a diagram. **(8 Marks)**
- Q3. a) Using a binary coding tree describe the process of encoding a single word using the Huffman algorithm. **(10 Marks)**
- b) The producer of the movie “Avatar” wants to produce a follow-up animated movie targeting the kindergarten audience. He needs you to draft a categorized list of the applicable software tools to complete the movie based on the components of a multimedia application. **(10 Marks)**
- Q4. a) Briefly describe the 4 commonly used lossless coding standards. **(8 Marks)**
- b) Explain the digitization process using an appropriate diagram. **(8 Marks)**
- c) Differentiate between analog signal and digital signal. **(4 Marks)**
- Q5. a) Briefly describe:
- i) Frequency Division Multiplexing. **(3 Marks)**
 - ii) Time Division Multiplexing. **(3 Marks)**
- b) Calculate the storage penalty in Kilobytes of storing an image with a resolution of 640x480 as a 24 bit color image as compared to an 8 bit gray level image. **(4 Marks)**
- c) Describe human vision with respect to spectral sensitivity of the eye and use an appropriate diagram. **(10 marks)**

END