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**University Examinations 2014/2015**

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

AND

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE COMPUTER SCIENCE

**CIT 3476: MULTIMEDIA SYSTEMS AND APPLICATIONS**

**DATE: APRIL 2015 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. In the field of Information and Communication Technology (ICT), multimedia means more than the use of the various media. Explain three uses (3 Marks)
2. Define the following coding scheme. Using this coding method compress the following uncompressed data: ABBBBCCDEFG
3. Run-length coding
4. Huffman coding (8 Marks)
5. Differentiate between a Digital Audio and MIDI (2 Marks)
6. Explain the three conventional broadcast systems (6 Marks)
7. Distinguish clearly between bitmap image and vector graphic (4 Marks)
8. Discuss the concept of kinematics and the main role it plays in animation (3 Marks)

**QUESTION TWO (20 MARKS)**

1. Explain five major areas of applications of multimedia and give examples of each

(10 Marks)

1. Video and animation give us a sense of motion. “They exploit some properties of human eye’s ability of viewing pictures”. Explain the statement in quotes and how videos are represented in computer systems (6 Marks)
2. Describe briefly the process of developing a simple animation (4 Mark)

**QUESTION THREE (20 MARKS)**

1. Define interpolation and discuss the two types of interpolations (5 Marks)
2. We record 10 seconds of stereo music at 44.1kHz, 16 bits. Calculate the size of the file

(3 Marks)

1. Discuss any three multimedia authoring tools (9 Marks)
2. Explain any three components of a Multimedia System (3 Marks)

**QUESTION FOUR (20 MARKS)**

1. In animation there are two kinds of visual effects; Motion dynamic and Update dynamic. Distinguish them (4 Marks)
2. Normal telephony audio captures analog frequencies up to 3.5KHz and has a digital data rate of 64Kb/s. Explain how this data rate came about and the basic principles involved, given the range of frequencies to be captured. Your answer should cover both the analog-to-digital conversion process and the final digital encoding used. (8 Marks)
3. Define the term data encoding as used in multimedia applications and outline the difference between the following data encoding techniques giving examples in each technique
4. Entropy encoding
5. Source coding
6. Hybrid coding (8 Marks)

**QUESTION FIVE (20 MARKS)**

1. Your hard disk has 256Mbytes of free space. You are going to record a speech with a sampling rate of 11KHz, 8-bit resolution and a single channel. What is the length of the recording that can be stored in the hard disk?(Answer in seconds) (5 Marks)
2. List and explain three challenges of multimedia systems (6 Marks)
3. Briefly describe three hardware devices used to capture multimedia elements. With each device name the multimedia element(s) captured and describe how the captured images can be fed into a computer (8 Marks)