SOUTH EASTERN KENYA UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

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

BIT 304: MULTIMEDIA SYSTEMS

<u>DATE: 08TH DECEMBER, 2017</u>   <u>TIME: 4.00 -6.00PM</u>

INSTRUCTIONS TO CANDIDATES

   a) **Answer questions ONE from section A(Compulsory)**

   b) **Answer <u>ANY TWO</u> questions from section B**

SECTION A (30 Marks) - Compulsory

Question One

a) Differentiate between the following terms as used in multimedia systems.   **(4 marks)**

   i. hypertext and hypermedia

   ii. *Persistence of Vision* and *Inverse kinematics*

b) Explain two broad categories of image search used in image retrieval systems.   **(4 marks)**

c) With the aid of a diagram show the encoding for the input {0,1,2,,10,128,205 ,210, 201, 195,

   120,50,30,40} using lossless predictive coding.   **(6 marks)**

d) Outline four characteristics of multimedia database products.   **(4 marks)**

e) Tom would like to produce a Distributed VR scene. Explain TWO connectivity approaches he
   could use to achieve this objective.   **(4 marks)**

f) With the aid of a diagram illustrate the MIDI message taxonomy.   **(3 marks)**

g) Using Huffman coding and with the aid of a diagram provide a unique coding for the following
   characters AAAAABBBBBBBBBCCCCCCCCCCCDDDDDDDDDDDDDEEEEEEEEEEEEE
   FFFFFFFFFF FFFFFFFFFF FFFFFFFFFF FFFFFFFFFF FFFFF   **(5 marks)**

SECTION B (40 marks)- Answer any TWO Questions

Question Two

a) Distinguish between *sampling* and *sampling frequency* as used in multimedia.   (**2 marks**)

b) PNG Image encoding takes place in 6 steps, with the aid of a diagram illustrate the steps.

(**6 marks**)

c) Describe three video standards and recording formats that could be applied in multimedia projects across the world.   (**6 marks**)

d) Given that self information of an event A is defined as $-log_b\ P(A)$ Estimate entropy for the following source {xxxyyyyzzzzww}   (**6 marks**)

Question Three

a) Explain the term *tweening* as used in multimedia.   (**1 mark**)

b) Distinguish between *alpha* and *beta* testing as used in multimedia projects.   (**2 marks**)

c) Outline three categories of analog media devices.   (**3 marks**)

d) Discuss the application of virtual reality in the following areas:

        I.   real estate;
        II.   healthcare ;
        III.   military;
        III.   education.   (**8 marks**)

e) With the aid of a diagram explain the Color Look Up Table for 8 bit color image

(**6 marks**)

Question Four

a) State two types of VRML.   (**2 marks**)

b) Explain three tasks the MPEG-7 descriptions allow a users or applications to perform.

(**6 marks**)

c) Agnes a Multimedia Technology student is developing a virtual reality scene for entertainment purposes. Explain two navigation techniques she could incorporate in the scene.   (**4 marks**)

d) Using Arithmetic coding and with the aid of a diagram calculate the codeword for input string CEA$ given the probabilities of the source as {A=0.2,B=0.1,C=0.2,D=0.05,E=0.3,F=0.05 and $=0.1}   (**8 marks**)