FACULTY OF SCIENCES
DEPARTMENT OF COMPUTER SCIENCE
2023_2 EXAMINATIONS_

COURSE CODE: CIT891
COURSE CREDIT: 3
COURSE TITLE: ADVANCED MULTIMEDIA TECHNOLOGIES
TIME ALLOWED: $2^{1}/_{2}$ HOURS
INSTRUCTION: ANSWER QUESTION ONE (1) AND ANY OTHER FOUR (4) QUESTIONS

QUESTIONS

1. **Question One**
   a. i. Briefly describe the concept of Multimedia Workstation **1Mark**
      ii. Give at least two (2) examples of the Multimedia Workstation. **1 Mark**
   b. Write a short note on Video Subsystem. **6 Marks**
   c. Sketch a block diagram representing the Predictive Coding Scheme. **4 Marks**
   d. Audio data is typically presented in one of three forms. List these forms and define what each means. **6 Marks**
   e. If $x(n)=x_R(n)+jx_I(n)$ is a complex sequence whose Fourier transform is given as $X(\omega)=X_R(\omega)+jX_I(\omega)$, determine the value of $X_R(\omega)$ in terms of sine and cosine functions **4 Marks**

(Total = 22 marks)

2. **Question Two**
   a. Mention briefly elucidate on each the three (3) common home TV distribution standards in Multimedia Technologies. **6 Marks**

2b. Using a detailed graph sketch, illustrate what happens when an original signal assumed to be a 6kHz sinewave is sampled at a rate of 8 kilo samples per second. **6 Marks**

3. **Question Three**
   a. Explain with detailed illustration, the additive colour mixing. **7 Marks**
   b. Briefly state and elucidate on any two (2) properties of a colour source. **5 Marks**

4. **Question Four**
   a. State the Nyquist Theorem. **2 Marks**
   b. Using a simplified block diagram discuss the design principle of a signal Decoder. **10 Marks**

5. **Question Five**
   a. Give a comprehensive analysis of Transform Coding **6 Marks**
   b. Write short notes on the following: **6 Marks**
      i. Image enhancement:
      ii. Image restoration
      iii. Image segmentation