UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

MARCH 2024

COURSE TITLE	MULTIMEDIA SYSTEM AND TECHNIQUES
COURSE CODE	RCIT3663
DATE/DAY	30 JUNE 2024 / SUNDAY
TIME/DURATION	01:00 PM - 03:00 PM / 02 Hour(s) 00 Minute(s)

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 7 Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of TWO (2) sections. Answer ALL questions in the answer booklet provided. **[100 MARKS]**

SECTION A **(40 Marks)**

There are TWENTY (20) questions in this section. Answer ALL questions in the answer booklet provided.

1. Complete the statement: Multimedia encompasses _____.

    A. audio
    B. video
    C. animation
    D. All of the above

2. Which of the following is **NOT** a characteristic of multimedia systems?

    A. Integration of different types of media
    B. Interactive
    C. Unidirectional communication
    D. High bandwidth requirement

3. Which of the following is **NOT** a multimedia input device?

    A. Keyboard
    B. Microphone
    C. Scanner
    D. Printer

4. Which of the following is a characteristic of a multimedia database?

    A. Stores only text data
    B. Stores only image data
    C. Stores different types of media data
    D. Stores only numeric data

5. State **two (2)** examples of nonlinear interactivity product.

    A. Movie and Website
    B. Movie and clip video
    C. Website and courseware
    D. Website and Clip video

6. _____ interactivity is a two-way communication process.

   A. Linear
   B. Hypertext
   C. Non-linear
   D. Multimedia

7. State a purpose of using text in multimedia production.

   A. To present information more attractively.
   B. Can help organize thoughts and illustrate processes.
   C. To provide information and express something.
   D. To perform the ideas interactively.

8. What are the advantages of a lossless compression?

   A. Only compatible with certain devices.
   B. Reduces file size without losing much quality.
   C. Increases file size without affecting audio or video quality.
   D. Has no advantage compared to other compression formats.

9. For image compression in multimedia applications, where a higher compression ratio is required, _____ method is usually adopted.

   A. lossy
   B. lossless
   C. loser
   D. lostness

10. Which one of the following represents the video compression method(s).

    A. H.261
    B. H.263
    C. H.261 and H.263
    D. None of the above

11. What does MPEG stand for?

    A. Motion Pictures Experts Group
    B. Moving Pictures Extend Group
    C. Moving Pictures Experts Group
    D. Motion Pictures Extend Group

12. What is the other name for interactive multimedia?

    A. Hypertext
    B. Hypermedia
    C. Graphic media
    D. Print media

13. The following are examples of storage devices **EXCEPT** for _____.

    A. Hard Disks
    B. FireWire
    C. DVD
    D. Blu-ray Discs

14. Both local area networks (LANs) and wide area networks (WANs) can connect the members of a workgroup, but _____ workstations are located within a short distance of one another.

    A. MANs
    B. WiFi
    C. WANs
    D. LANs

15. It is profoundly frustrating to face memory shortages time after time when you are attempting to keep multiple applications and files open simultaneously. Identify the hardware that can be upgraded in order to allow a computer to run smoothly.

    A. RAM
    B. ROM
    C. CPU
    D. Hard Disk

16. What is the purpose of Real-Time Transport Protocol (RTP)?

    A. To shape traffic for multimedia applications.
    B. To provide sequence numbers and timestamps for multimedia transmission.
    C. To mark packets based on source and destination.
    D. To establish multimedia connections.

17. Which protocol is used for signaling and negotiating parameters in voice and video conferencing over the Internet?

    A. Real-Time Transport Protocol (RTP)
    B. Session Initiation Protocol (SIP)
    C. H.323 Protocols
    D. Transmission Control Protocol (TCP)

18. What is the purpose of Traffic Policing in network QoS?

    A. To ensure users are sending at the agreed rate.
    B. To smooth out traffic for easier handling.
    C. To alter the traffic characteristics of a given flow.
    D. To provide different service levels for packets

19. Which protocol is used for multimedia over LANs and provides signalling procedures, call control, and audio/video codecs?

    A. User Datagram Protocol (UDP)
    B. Real-Time Transport Protocol (RTP)
    C. H.323 Protocols
    D. Session Initiation Protocol (SIP)

20. Which component of QoS is responsible for ensuring that users are sending traffic at the rate they agreed to?

    A. Shaping
    B. Policing
    C. Signaling
    D. Admission Control

SECTION B (60 Marks)

There are **FIVE (5)** questions in this section. Answer **ALL** questions in an essay format.

Question 1 (4 marks)

What is Multimedia? Provide a comprehensive definition.

Question 2 (8 marks)

What is linear and non-linear multimedia? Give **TWO (2)** examples for each element.

Question 3 (15 marks)

Give **FIVE (5)** benefits of a multimedia system. For each benefit, state your answer and elaborate it in one sentence.

Question 4 (20 marks)

Answer the questions below with some explanation.

(a) What is the sampling rate? How does the sampling rate affect the quality of the audio signal?

(b) What is playout delay? What is the purpose of playout delay in constant bit rate video transmission?

(c) What is SIP? How does SIP help establish multimedia connections?

(d) Explain the functionalities of the Registrar, Location server, Proxy, and Redirect server components in the context of SIP (Session Initiation Protocol) architecture and their roles in facilitating multimedia communication sessions.

Question 5
(13 marks)

Considering the various components of Quality of Service (QoS), such as traffic shaping, prioritization, and congestion management, propose a hypothetical scenario in which a network administrator must optimize QoS for a multimedia streaming service while ensuring fair resource allocation for other network activities. Analyze the potential challenges and trade-offs involved in balancing the QoS requirements of multimedia applications with the needs of other network users and propose a comprehensive strategy to achieve optimal performance and user satisfaction.

*** **END OF QUESTION PAPER** ***