Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Master's Degree Examination – May 2025
II Semester

Class : I M.C.A. **Time: 3 Hours**
Major : Computer Applications **Max. Marks: 100**

23MCAC11 Data Communication and Networks

Course Outcomes:
CO1: Explain the layered communication architectures and its functionalities.
CO2: Assess the network switching techniques.
CO3: Appraise various error detection & correction techniques and flow control protocols.
CO4: Analyze the MAC and network layer protocols.
CO5: Outline the Transport layer and Application layer functions and Protocols

Part A **10 x 1 = 10**
Choose the Correct Answer

1. The communication is governed by an agreed upon series of rules and conventions CO1K1
   a. Layers b. Protocols c. Socket d. Network

2. _____ is a digital multiplexing technique for combining several low-rate channels into one high-rate one. CO1K3
   a. WDM b. FDM c. TDM d. DWDM

3. _____switching is a communication method where a dedicated communication path is established between two devices before data transmission begins. CO2K1
   a. Circuit b. Packet c. Message d. Ethernet

4. _____ antenna is used in radio waves to send out signals in all directions. CO2K1
   a. Omni directional b. Bidirectional c. Unidirectional d. Directional

5. In _____ error two or more bits in the data unit have changed. CO3K1
   a. Single bit b. Burst c. Flag d. Ack

6. Error correction in _____ ARQ is done by keeping a copy of the sent frame and retransmitting of the frame when the timer expires. CO3K1
   a. Selective repeat b. Stop-and-Wait c. Go-Back-N d. HDLC

7. The IEEE has subdivided the datalink layer into _____ and _____. CO4K1
   a. TCP and UDP b. LLC and MAC c. LAN and MAN d. WSN and IoT

8. A BSS without an access point is called as _____ network. CO4K1
   a. Ad-hoc b. Infrastructure c. Local Area d. Personal Area

9. _____ segments in error control do not consume sequence numbers and are not acknowledged. CO5K1
   a. BCK b. PACK c. NACK d. ACK

10. The domain node always read from the node up to the CO5K1
    a. Branches b. Leaf c. Child d. Root

Part B 5 x 6 = 30

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. With illustration, state the difference between port address, logical address and physical address. CO1K3

(or)

11. b. Compare and Contrast TCP with UDP. CO1K4

12. a. With a neat sketch, Compare circuit-switched network with packet-switched network. CO2K4

(or)

12. b. Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required bandwidth. CO2K4

13. a. Sketch and explain CRC encoder and decoder . CO3K3

(or)

13.b. Sketch and explain the design of Go-Back-N ARQ. CO3K3

14. a. Sketch and explain the behaviour of three persistent models. CO4K3

(or)

14.b. Outline the hidden and exposed problem with appropriate diagrams. CO4K3

15. a. Depict the ARP packet format and mention the usage of each field. CO5K4

(or)

15.b. “Does DNS system directly use an IP address?”. Answer the query and justify your answer. CO5K5

Part C 5 x 12 = 60

Answer ALL questions

Each answer should not exceed 800 words or four pages

16. a Elaborate the OSI model with appropriate diagrams. CO1K4

(or)

16. b With appropriate diagram and illustration explain three mechanisms for modulating digital data into an analog data. CO1K2

17. a Answer the following questions: [Each carries 6 marks] CO2K5

i. Can a routing table in a datagram network have two entries with the same destination address? Explain.

ii. Can a switching table in a virtual-circuit network have two entries with the same input port number? With the same output port number? With the same incoming VCIs? With the same outgoing VCIs? With the same incoming values (port, VCI)? With the same outgoing values (port, VCI)?

(or)

17.b. With appropriate sketch discuss about cable TV for data transfer. CO2K3

18. a. Explain block coding with appropriate diagrams. CO3K3

(or)

18.b. Write a detailed note on framing in data link control. CO3K3

19.a. Elaborate on CSMA/CD. CO4K3

(or)

19. b. Discuss in detail about distance vector routing with diagrams. CO4K2

20.a. Discuss briefly about three-way handshake in TCP. CO5K4

(or)

20.b. Sketch the architecture of WWW and explain in detail. CO5K3

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