USN | 0 | 1 | J | C | E | 2 | 1 | C | S | 1 | 2 | 1 |

20CS430

JSS MAHAVIDYAPEETHA
JSS SCIENCE AND TECHNOLOGY UNIVERSITY, MYSURU
Department of Computer Science and Engineering
IV Semester: Test 1(Event 1)
A, B, C, D & E Sections
Data Communication

Duration: 1 hour Date: 05.05.2023 Max. Marks: 20

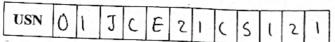NOTE: Question 1 is compulsory, Question 2 and 3 has an internal choice.

Q.No	PI	CO	CD	QUESTION	MARKS
1.	2.6.1	CO1	L2	a. Suppose a device is moved from one network to another, what type of addresses need to be changed? Justify with a detailed explanation.	4M
	2.6.1			b. Write the purpose of protocol layering in computer networks and briefly explain the responsibilities of the Network layer.	6M
2.	2.6.1	CO1	L2	a. Discuss any 2 categories of physical topology that can be used in communication networks.	6M
	9.5.1			b. Write the role of intermediate devices in connecting to wider networks.	4M
				OR	
3	2.6.1	CO1	L2	a. Explain encapsulation and de-capsulation processes in networks with a neat diagram.	6M
	9.5.1			b. Assume six devices are arranged in a mesh topology. How many (i) Cables are needed. (In Duplex mode) (ii) Number of ports required for each device? (2 M) c. We have two computers connected by an Ethernet hub at home. Is this a LAN or a WAN? Give reasons. (2M)	4M

Course Outcome	
CO1	Explain the basic concepts of computer networks and different types of network models.
CO2	Discuss various elements of the physical layer and different data transmission modes.
CO3	Explain the fundamental concepts of multiplexing, transmission media, and switching.
CO4	Apply various error detection and correction methods.
CO5	Illustrate data link layer services and different media access control.

PI's	
2.6.1	Reframe the computer-based system into interconnected subsystems
4.6.2	Critically analyze data for trends and correlations, stating possible errors and limitations
9.5.1	Demonstrate effective communication, problem-solving, conflict resolution, and leadership skills

Blooms Taxonomy
L1: Remember; L2: Understand; L3: Apply

20CS430

JSS MAHAVIDYAPEETHA
JSS SCIENCE AND TECHNOLOGY UNIVERSITY, MYSURU

Computer Science and Engineering
IV Semester: Event 3
A, B, C, D & E Sections
Data Communication

Duration : 1 hour

Date: 13.06.2023

Max. Marks: 20

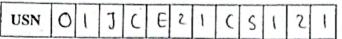**NOTE: Question 1 is compulsory, Question 2 and 3 has internal choice.**

Q.No	PI's	CO	CD	QUESTION	MARKS
1.	2.1.1 2.4.4	CO2	L3	1a. Assume we need to download text documents at the rate of 80 pages per second. What is the required bit rate of the channel?	2
	2.1.1 2.4.4		L3	1b. A signal is carrying data in which one data element is encoded as one signal element ($r = 1$). If the bit rate is 100 kbps, what is the average value of the baud rate if c is between 0 and 1?	2
	2.2.5		L2	1c. With diagrams, Write about three Sampling methods.	6
2.	2.3.1	CO2	L2	2a. Discuss in detail, Baseband transmission with diagrams.	4
	2.2.5		L2	2b. Explain NRZ-I, Differential Manchester and Manchester coding schemes with examples.	6

OR

Q.No	PI's	CO	CD	QUESTION	MARKS
3	2.4.3	CO2	L2	3a. List and explain causes of Impairments	6
	2.2.5		L2	3b. Write a note on quantization levels and quantization error and relationship among those.	4

Course Outcome	
CO1	Explain the basic concepts of computer networks and different types of network models.
CO2	Discuss various elements of physical layer and different data transmission modes.
CO3	Explain the fundamental concepts of multiplexing, transmission media and switching.
CO4	Apply various error detection and correction methods.
CO5	Illustrate data link layer services and different media access control.

PI's	
2.1.1	Evaluate problem statements and identifies objectives.
2.2.5	Compare and contrast alternative solution processes to select the best process.
2.3.1	Able to apply computer engineering principles to formulate modules of a system with required applicability and performance
2.4.3	Identify the limitations of the solution and sources/causes.
2.4.4	Arrive at conclusions with respect to the objectives.

Blooms Taxonomy

L1: Remember; L2: Understand; L3: Apply

JSS MAHAVIDYAPEETHA
JSS SCIENCE AND TECHNOLOGY UNIVERSITY, MYSURU

Computer Science and Engineering
IV Semester: Test 3
A, B, C, D & E Sections
Data Communication

Duration : 1 hour   Date: 07.07.2023   Max. Marks: 20

NOTE: Question 1 is compulsory, Question 2 and 3 has internal choice.

Q.No	PI	CO	CD	QUESTION	MARKS
1.	1.4.1	CO4	L2	a. With an example explain the computation of Internet Checksum. List the steps undertaken by the sender and receiver for error detection.	6
	2.3.1		L3	b. Define Cyclic Code. Find the Codeword C(x), using CRC for the information 100100 with Generator 1101.	4
2.	1.4.1	CO4	L2	a. Explain briefly the Error Detection and Correction in Block Coding with an example.	6
	2.1.1		L2	b. Explain the following Forward Error Correction techniques. i)Hamming Distance ii)XOR	4
OR					
3	2.3.1	CO4	L2	a. Discuss Simple Parity Check code with neat diagram.	6
	2.1.1		L2	b. What is Hamming Distance? Discuss the need for Minimum Hamming Distance.	4

Course Outcome	
CO1	Explain the basic concepts of computer networks and different types of network models.
CO2	Discuss various elements of physical layer and different data transmission modes.
CO3	Explain the fundamental concepts of multiplexing, transmission media and switching.
CO4	Apply various error detection and correction methods.
CO5	Illustrate data link layer services and different media access control.

PI's	
1.4.1	Apply theory and principles of computer science and engineering to solve an engineering problem
2.1.1	Evaluate problem statements and identifies objectives.
2.3.1	Able to apply computer engineering principles to formulate modules of a system with required applicability and performance

Cognitive Domain
L1: Remember; L2: Understand; L3: Apply

IV Semester BE Degree Examination
Department of Computer Science & Engineering

DATA COMMUNICATION

Duration: 3 hrs   Max. Marks: 100

<u>NOTE:</u> **1. Answer the following questions. Part B has internal choice.**
          2. Assume any missing data suitably.

PART – A

Q.NO	CO	CD	PI	QUESTION	MARKS
1.	CO1	L3	1.3.1	a. With an example of an application, justify the notion of layering in internetworking.	8
				b. What difference does it make, if the connectionless service offered by IP layer in TCP/IP is provided by the data link layer?	2
2.	CO3	L3	1.3.1 2.4.1	a. What is the amount of memory required to store a color image of 1024 x 768 size. Also find the time required to transmit the above image over a 1.5 Mbps network.	5
				b. A high quality speech signal has a bandwidth of 8 K HZ is to be transmitted over 28.8 Kbps modem. What is the SNR required for the speech signal?	5
3.	CO3	L3	1.3.1 2.4.1	a. We need to use synchronous TDM and combine 20 digital sources, each of 100 Kbps. Each slot carries 1 bit from each digital source, one extra bit is added to each frame for synchronization. I. What is the size of an output frame in bits? II. What is the output frame rate? III. What is the duration of an output frame? IV. What is the output data rate? V. What is the efficiency of the system?	10

4.	CO3	L3	1.3.1 2.4.1	a. Let g1(x) = x² + x +1 and g2(x) = x³ + x² + 1. Consider the information bits (1,1,0,1,1,0)		
				I. Find the codeword corresponding to the information, if g1(x) is used as generating polynomial.	5	
				II. Find the codeword corresponding to the information, if g2(x) is used as generating polynomial.	5	
5.	CO2	L2	2.1.1 2.4.1	a. In the Stop-and-Wait Protocol, assume that the sender has only one slot to keep the copy of the frame sent. What happens if the network layer delivers a packet to the data-link layer at this moment? How is it different in Selective repeat protocol?	8	
				b. Assume a new character-oriented protocol is using the 16-bit Unicode as the character set. What should the size of the flag be in this protocol?	2	

PART – B

Q.NO	CO	CD	PI	QUESTION	MARKS
6	CO1	L2	1.3.1	a. Explain briefly the different physical topology that can be used for networking with their merits and demerits.	10
				OR	
7	CO1	L2	1.3.1	a. Describe briefly the working of TCP/IP protocol suite with a neat figure.	10
8	CO2	L3	2.1.1 2.4.1	a. A nonperiodic composite signal has a bandwidth of 200 kHz, with a middle frequency of 140 kHz and peak amplitude of 20 V. The two extreme frequencies have amplitude of 0. Draw the frequency domain of the signal.	4

		CO2	L1		b. What is bit rate?	2
			L3		c. Assume we need to download text documents at the rate of 100 pages per second. What is the required bit rate of the channel?	4

OR						

9	CO1	L1	1.3.1	a. What is line coding? Describe briefly any 4 line coding schemes with figure.	10

10	CO1	L2	1.3.1	a. Explain briefly multilevel TDM, multiple-slot TDM, and pulse-stuffed TDM with relevant figures	10

OR					

11	CO2	L2	1.3.1	a. Describe briefly the working of optical fiber with a neat figure	10

12	CO2	L2	2.1.1 / 2.4.1	a. Sender A transmits data to Receiver B, during the course of transmission there is possibility of data being breached. Briefly describe the sources of data breaches and also the process of error detection.	10

OR					

13	CO2	L2	1.3.1	a. Explain briefly the Internet checksum with an example	10

14	CO1	L2	1.3.1	a. Describe briefly the HDLC frame format with a neat figure	10

OR					

15	CO1	L2	1.3.1	a. With necessary illustrations, show how window size play an important role in resolving ambiguities in Go Back N protocol	10