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RV COLLEGE OF ENGINEERING®
(An Autonomous Institution affiliated to VTU)
V Semester B. E. Examinations March / April-2023
Computer Science and Engineering
COMPUTER COMMUNICATION AND NETWORKS

Time: 03 Hours   *Maximum Marks: 100*
Instructions to candidates:
1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6

PART-A

1	1.1	A colour image uses 16 bits to represent a pixel. What is the maximum number of different colours that can be represented?	01
	1.2	List different modes of communication in computer networks with an example for each.	02
	1.3	The OSI Layer responsible for compression and encryption is _____.	01
	1.4	A sine wave is offset 1/6 cycle with respect to time 0.What is its phase in degrees and radians?	02
	1.5	When a new computer is plugged into the network then it first executes _____ to know_____ address.	01
	1.6	What is the necessity of having logical address even though we have physical addresses for the devices in a network?	02
	1.7	A text document is to be downloaded at the rate of 100 pages per minute. Each page has 24 lines of 80 characters each. Compute the bps of the channel.	02
	1.8	Write the Pseudoternary line coding scheme for the bit pattern 001011.	02
	1.9	Bandwidth of a full-duplex ASK is 200kHz which spans from 300kHz to 500kHz. What is the position of the carrier frequencies?	02
	1.10	In the reservation frame, how many number of reservation mini-slots are present if the total number of stations are 10.	02
	1.11	_____ is the multiplexing scheme applied for digital signals.	01
	1.12	If the station A is a primary station and B is a secondary station _____ frame is sent by A when it has some data to send to B.	02

PART-B

2	a	Explain the components and characteristics of data communication systems.	08
	b	With a neat diagram explain the peer-to-peer process in data communication using OSI model.	08

| 3 | a | What is the difference between periodic and non-periodic signals? A non-periodic composite signal contains frequencies from 10 to 30 kHz, The peak amplitude is 10V for the lowest and the highest signals and is 30V for the 20kHz signal. If the amplitudes change gradually from the minimum to maximum, draw the frequency spectrum. | 08 |
| | b | Explain different Line coding schemes with examples. | 08 |

OR

| 4 | a | The light of the sun takes approximately 8.3 minutes to reach the earth. What is the distance between the sun and the earth? | 06 |
| | b | What is scrambling? For the bit pattern given below, draw the Bipolar AMI, B8ZS and HDB3 diagrams: 11000000000110000010. Note: for HDB3 assume that the number of non-zero pulses after last substitution is odd. | 10 |

| 5 | a | Define multiplexing. Explain the methods used for multiplexing analog signals. | 08 |
| | b | Differentiate between error detection and error detection. Explain any one method for each in detail. | 08 |

OR

| 6 | a | Discuss the different schemes of Time Division Multiplexing (TDM) with neat diagrams. | 08 |
| | b | Explain CRC encoder and decoder with a neat diagram. | 08 |

| 7 | a | Illustrate the design and algorithm of a protocol which has flow control used for noiseless channel. | 10 |
| | b | Give the Taxonomy of multiple-access protocols and briefly write about each category. | 06 |

8	a	What is the frame structure used by IEEE 802.3 protocol? Explain with a neat diagram.	08
	b	Consider building a CSMA/CD network running at 1 Gbps over a 1km cable. The signal speed in the cable is $2 \times 10^5\ kms\ per\ second$. What is the minimum frame size?	04
	c	Discuss two kinds of services offered by IEEE802.11 with suitable diagram.	04