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Code No. : 22114

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (C.S.E.) II Year II-Semester Main & Backlog Examinations, May-2017**

**Data Communication**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A ( $10 \times 2 = 20$  Marks)**

1. Why are protocols needed?
2. Draw the graph of NRZ-I scheme for the bit stream 01000101 assuming last signal level has been positive.
3. What is the difference between half-duplex and full-duplex transmission modes?
4. What is interleaving?
5. How does a single-bit error differ from a burst error?
6. What is the hamming distance for the code words d (10000, 01000)?
7. Design a wired LAN with 4 bus LANs and 3 ring LANs connected to a star backbone.
8. What are the common Standard Ethernet implementation?
9. There are 4 departments in a company say D1, D2, D3 and D4. Each department has 10 technical employees and 5 non- technical employees. Design a Virtual LAN VLAN1 and VLAN2 with all technical employees in one group and non-technical employees in another group.
10. What is the functionality of a bridge?

**Part-B ( $5 \times 10 = 50$  Marks)**

*(All bits carry equal marks)*

11. a) Define a network. What are the criteria necessary for an effective and efficient network? Explain each one briefly.  
b) What is the result of scrambling the sequence 11100000000000 using the following scrambling techniques? Assume last non-zero signal level has been positive.  
i) B8ZS  
ii) HDB3 (The number of non-zero pulses is odd after last substitution)
12. a) What is packet switching? Explain in detail with the help of diagram.  
b) What is Multilevel Multiplexing? Consider 5 input connections with 40 Kbps, 40 Kbps, 80 Kbps, 80 Kbps, 80 Kbps data rates. Design a multilevel multiplexer with an output of 320 Kbps.
13. a) Briefly describe the services provided by the data link layer.  
b) What is Cyclic Redundancy Check (CRC)? Explain CRC encoder and decoder considering data word 101001111 and the divisor 10111. Generate the transmitted message at the sender and verify the correctness of the received message.
14. a) Explain the significance of each field in an Ethernet frame.  
b) What is the use of Ethernet LAN? Why is there no need for CSMA/CD on a full-duplex Ethernet LAN?

15. a) Discuss about Bluetooth layers. Match the layers in Bluetooth and the Internet model.  
b) Why backbone networks are used? Explain Bus backbone and Star backbone.
16. a) Explain TCP/IP protocol suite.  
b) Discuss about statistical time-division multiplexing.
17. Write short notes on any *two* of the following:
- a) Error control.
  - b) Gigabit Ethernets.
  - c) Spanning Tree Bridge.

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