Hall Ticket Number:

Code No. : 14606

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (IT: CBCS) IV-Semester Main Examinations, May-2018

Data Communications

Time: **3** hours Max. Marks: **70**

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

Part-A (10 × 2 = 20 Marks)

1. Distinguish between baseband transmission and broadband transmission
2. Identify five components of data communications.
3. Define scrambling and give its significance.
4. List any three techniques of digital-to-digital conversion.
5. How does a single-bit error differ from a burst error?
6. Define Hamming distance. Find the Hamming distance between the codewords 10111001 and 11001101.
7. Consider five input connection with 20Kbps, 20Kbps, 40Kbps, 40Kbps and 40Kbps data rates. Design a multilevel multiplexer with an output of 160Kbps.
8. State the significance of bit stuffing and byte stuffing in data transmission.
9. Compare Thick Ethernet with Thin Ethernet
10. Mention whether the Ethernet destination address 05:01:02:03:04:05 is unicast, multicast or broadcast.

Part-B (5 × 10 = 50 Marks)

11. a) Name the services provided by the physical layer and data link layer in the TCP/IP Protocol suit. [4]

    b) Identify various transmission impairments in data communications. [6]

12. a) Discuss any three digital-to-analog conversion techniques with suitable diagrams. [5]

    b) Explain how analog data is converted to digital using Pulse Code Modulation. [5]

13. a) Compare and contrast Go-Back-N ARQ Protocol with Selective-Reject ARQ with the help of neat diagrams. [4]

    b) Given the data word 1010011110 and the divisor 10111, show the generation of the codeword at the sender site (using binary division). Also show the checking of the codeword at the receiver site (assume no error). [6]

14. a) Explain about the DSL technology. Mention the services provided by the telephone companies using DSL. [5]

    b) Four channels, two with a bit rate of 400Kbps and two with a bit rate of 200Kbps. Are to be multiplexed using multiple- slot TDM with no synchronization bits. [5]

    i) What is the size of a frame in bits?
    ii) What is the frame size?
    iii) What is the frame duration?
    iv) What is the data rate?

Contd... 2

15. a) Explain the frame format of 802.3 MAC frame. [5]

    b) An Ethernet MAC sublayer receives 1540 bytes of data from the upper layer. Can the data be encapsulated in one frame? If not, how many frames need to be sent? Also mention the size of the data in each frame. [5]

16. a) Assume eight devices are arranged in mesh topology. How many cable are needed? How many ports are needed at each device? What advantages we can have, if the devices were arranged in star topology? [5]

    b) Explain Analog-to-Digital conversion using Delta Modulation. [5]

17. Answer any ***two*** of the following:

    a) Distinguish between forward error correction versus error correction by retransmission. [5]

    b) Explain the cell switching mechanism in ATM. [5]

    c) What is the use of Ethernet LAN? Why is there no need for CSMA/CD on a full duplex Ethernet LAN. [5]