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B.E. (Computer Science Engineering) Fifth Semester (C.B.S.)

Data Communication

P. Pages : 2 **NJR/KS/18/4488**

Time : Three Hours Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Explain Simplex, Half duplex, full duplex communication with neat sketch. **3**

b) Differentiate between : **10**
i) Analog signal and digital signal.
ii) Periodic signal and Aperiodic signal.
iii) Baseband and Broadband transmission.

OR

2. a) Explain serial and parallel transmission. **6**

b) How many bits can fit on a link with 2 ms delay if the bandwidth of the link is **7**
i) 1 mbps
ii) 10 mbps
iii) 100 mbps

3. a) Explain Pulse Code Modulation technique for analog to digital conversion. **7**

b) We have baseband channel with 1MHz bandwidth. What is the data rate for the channel if we use one of the following line coding scheme. **6**
i) NRZ-L
ii) Manchester
iii) MLT-3
iv) 2B1Q

OR

4. a) Explain the three techniques of analog to analog conversion. **7**

b) Calculate the bit rate for the given baud rate and type of modulation **6**
i) 1000 baud, FSK
ii) 1000 baud, ASK
iii) 1000 baud, BPSK
iv) 1000 baud, 16 QAM

5. a) Explain the purpose of cladding in optical fiber. Explain advantages & disadvantages of optical fiber. **7**

b) What is frequency reuse concept? Explain Cellular Telephony. **7**

OR

6. a) Explain radio waves and microwaves. **7**

b) A beam of light moves from one medium to another medium with less density. The critical angle is 60º. Do we have refraction or reflection for each of the following incident angles? Show the bending of the light rays in each case. **7**

i) 40º
ii) 60º
iii) 80º

7. a) Distinguish between multilevel TDM, multiple slot TDM and pulse stuff TDM. **6**

b) Explain FDM & TDM in detail. **7**

OR

8. a) Explain FHSS with suitable diagram. **6**

b) Two channels one with bit rate of 190 kbps and another with bit rate of 180 kbps are to be multiplexed using pulse stuffing TDM with no synchronization bits **7**

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

9. a) Explain the characteristics of Real Time Interactive Audio / Video. **7**

b) Explain Real Time Transport Protocol. **6**

OR

10. a) Explain HTTP and WWW with suitable diagram. **6**

b) Explain digitizing audio / video techniques. **7**

11. a) What is data compression? Explain Image Compression : JPEG. **8**

b) Explain Video Compression : MPEG. **6**

OR

12. Solve the following : **14**

i) Run Length Coding.

ii) Huffman Coding.

iii) LZW.

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High expectations are the key to everything.

~ Sam Walton