B.E.(Computer Technology) Semester Fifth (C.B.S.)
Data Communication

P. Pages : 2

Time : Three Hours

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0660

Max. Marks : 80

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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. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) Differentiate between :   9

i)   Analog Vs. Digital Signal

ii) Serial and Parallel transmission

iii) Periodic and Aperiodic signal

b) A non - periodic composite signal has a bandwidth of 200 kHz, with a middle frequency   4
of 150 kHz and peak amplitude 20V. Draw the frequency domain of the signal.

OR

2. a) Explain simplex, Half duplex and full duplex communication with example.   7

b) Explain Synchronous and Asynchronous transmission.   6

3. a) What is line coding? Explain its characteristics?   6

b) Digital data 11001010 is to be transmitted. Draw the resulting waveforms for the   8
following methods and give the explanation for each.
i)   Unipolar NRZ   ii) Polar NRZ
iii) Manchester   iv) AMI

OR

4. a) Explain in detail three techniques of digital to digital conversion.   8

b) What is Nyquist sampling rate for each of the following signal.   6
i)   A low pass signal with bandwidth of 300 kHz.
ii) A bandpass signal with a bandwidth of 300 kHz. If the lowest frequency is 100 kHz.

5. a) Differentiate between guided and unguided transmission media.   6

b) What do you mean by line - of - sight propagation? Also compare and contrast the Dish   7
antenna and Horn antenna.

OR

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6. a) Explain in brief : 6

    i)   Twisted pair cable

    ii)   Coaxial cable

    b) Explain the purpose of cladding in optical fiber. Explain advantage and disadvantage of optical fiber. 7

7. a) What is Spread Spectrum? Explain FHSS with suitable diagram. 6

    b) What is DSL technology? What are services provided by the telephone companies using DSL? Distinguish between DSL modem and DSLAM. 7

<div align="center">OR</div>

8. a) Explain process of Interleaving in TDM. 6

    b) Ten couriers, six with a bit rate of 200 kbps and four with a bit rate of 400 kbps are to be combined using multilevel TDM with no synchronizing bits. Answer the following questions about the final stage of multiplexing. 7
    i)   What is the size of frame in bits?
    ii)   What is the frame rate?
    iii)   What is the duration of frame?
    iv)   What is data rate?

9. a) Explain Real Time Protocol of network layer in detail. 6

    b) Explain WWW Architecture and HTTP. 7

<div align="center">OR</div>

10. a) Explain LZW with example. 7

    b) Explain three type of web documents. 6

11. a) Explain MPEG compression techniques. 7

    b) Explain in detail Run - length Encoding. 7

<div align="center">OR</div>

12. a) What is relative encoding? Explain with an example? 5

    b) Write Huffman encoding algorithm. Draw the Huffman tree for the graph data and device the Huffman code. 9

Letter	a	b	c	d	e	f
Frequency of occurrence	45	13	12	16	9	5

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