

Data Communication

P. Pages : 2

Time : Three Hours



NRT/KS/19/3433

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. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) A periodic composite signal contains frequencies from 10 to 30 kHz, each with an amplitude of 10V. Draw the frequency spectrum. **5**
- b) Explain how a signal can be represented using Time domain and frequency domain. **5**
- c) Define bit rate, bit length, bandwidth, throughput, latency. **4**

OR

2. a) Explain various transmission modes. **6**
- b) Distinguish between Analog signal and Digital signal. **4**
- c) Given the frequencies listed below, calculate the corresponding periods **4**
 - i) 24 MHz
 - ii) 8 MHz
 - iii) 140 kHz
3. a) Explain the working of Pulse Code Modulation (PCM). **7**
- b) Discuss 4B/5B Block coding scheme. **6**

OR

4. a) Which of the four digital to analog conversion techniques (ASK, FSK, PSK or QAM) is the most susceptible to noise. Defend your answer. **4**
- b) Explain phase modulation with an example. **6**
- c) Distinguish between signal element & data element. **3**
5. a) Give the advantages & disadvantages of optical fiber. **5**
- b) Draw and explain the structure of Twisted pair cable. **5**

c) What is refraction? What is reflection. **3**

OR

6. a) Discuss cellular telephony in detail. **7**

b) Explain Radio wave and satellite communication in detail. **6**

7. a) Assume that a voice channel occupies a bandwidth of 4kHz. We need to multiplex 10 voice channels with guard bands of 500Hz using PDM. Calculate the required bandwidth. **4**

b) Write short notes on WDM. **6**

c) Distinguish between the link and a channel in multiplexing. **3**

OR

8. a) Define DSSS and explain how it achieves bandwidth spreading. **6**

b) Explain process of interleaving in TDM. **7**

9. a) Write short note on MPEG video compression technique. **8**

b) Explain the characteristics of real time interactive Audio/Video. **5**

OR

10. a) Draw the block diagram of JPEG encoder and explain it. **7**

b) Differentiate between characteristics of JPEG and MPEG technique. **6**

11. a) Write short notes on Huffman coding. **7**

b) Explain www and also define static page and dynamic page. **7**

OR

12. a) Explain in detail Lempel-ziv encoding technique. **7**

b) Write short notes on RTP. **7**
