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Question Paper Code : 20423

B.E/B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Sixth Semester

Electrical and Electronics Engineering

EC 6651 — COMMUNICATION ENGINEERING

(Also Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the differences between SSB-AM and VSB-AM techniques?

2. State the relation between PM and FM?

3. What is MSK?

4. Is OOK (On-Off Keying) commonly employed? Why?

5. Define the entropy of a Discrete Memoryless Source (DMS).

6. What are the differences between block code and convolutional code?

7. What is CDMA? Does employing an unique code for each transmission in CDMA implies very large number of users in the communication system?

8. Why is multiple access required?

9. State the application of C-band in satellite communication?

10. What is a photo detector? What is its important requirement?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Derive the power relations for Amplitude Modulation. (7)

(ii) Describe the Armstrong method of FM generation. (6)

Or

(b) (i) Derive the relation for power spectrum for FM and sketch it. (7)

(ii) Compare and contrast NBFM and WBFM. (6)

12. (a) (i) A low pass signal with highest frequency of 15 kHz has to be digitized. What is the required sampling frequency? Why? (6)

(ii) What is quantization? Why is it employed in a digital communication system? Explain any one quantization procedure. (7)

Or

(b) (i) What is QPSK? What is its advantage over a BPSK system? Describe a QPSK modulator and a demodulator. (2+1+4)

(ii) With a neat block diagram, explain the working of a PCM system. (6)

13. (a) (i) Compare and contrast BEC and a BSC. (6)

(ii) Explain the BW-SNR trade-off with related theorem. (7)

Or

(b) (i) What is source coding? What is error control coding? Compare and contrast these two essential coding techniques in a digital communication system. (2+2+3)

(ii) Explain the procedure of computing a Shannon-Fano code. (6)

14. (a) (i) With a sketch, describe the TDMA scheme. (3+4)

(ii) What is the concept of SDMA technique? With relevant sketch, describe the same. (6)

Or

(b) (i) Describe an FDMA scheme with relevant sketch(es). (7)

(ii) Describe a CDMA scheme with respective sketches. (6)

15. (a) (i) With a block diagram, describe the satellite communication system. Usually the uplink frequency is greater than the downlink frequency in satellite communication. Why? (7)

(ii) Describe the very important advantages of optical fibers. (6)

Or

(b) (i) Describe the different types of Multiple Access techniques used in a satellite environment. (7)

(ii) Describe the power line carrier communication and state its very important advantage(s). (6)

PART C — (1 × 15 = 15 marks)

16. (a) Analyse the advantages of delta modulation. How is it different from adaptive delta modulation? Justify. (7+8)

Or

(b) Compare and contrast GMSK versus MSK and discuss on the advantages and disadvantages of both the techniques. (7+8)

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