Reg. No. : | | | | | | | | | | | | |

Question Paper Code : X 10359

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020/
APRIL/MAY 2021
Third/Fourth/Sixth Semester
Electrical and Electronics Engineering
EC 8395 – COMMUNICATION ENGINEERING
(Common to Computer Science and Engineering/Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)
(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define amplitude modulation. Write amplitude modulated wave equation.
2. Mention the advantages of superheterodyne receiver.
3. State the sampling theorem in time domain.
4. Draw the block diagram of adaptive delta modulator.
5. Compare BPSK and DPSK (any two).
6. Why is pulse shaping necessary in digital communication ?
7. Define entropy.
8. What are the basic principles of Huffman coding ?
9. Why pseudo noise sequences are used in spread spectrum modulation ?
10. Mention the salient features of the FDMA system.

PART – B **(5×13=65 Marks)**

11. a) With the help of neat diagram explain the operation of balanced modulator using diodes. Compare AM modulation techniques.

(OR)

b) What is angle modulation ? Derive the expression of frequency modulated wave and mention its merits.

12. a) With the help of neat diagram, explain the transmitter and receiver of pulse code modulation.

(OR)

b) What is the need for multiplexing ? Explain multiplexing techniques with suitable example and compare the techniques.

13. a) Explain the block diagram of QPSK system and principles of many signaling.

(OR)

b) Explain the working principle of many PSK and significance of eye pattern.

14. a) Explain the following terms is used in information theory.

i) Entropy

ii) Channel capacity

iii) Redundance

iv) Coding

v) S/N Ratio bandwidth trade off.

(OR)

b) Design a syndrome calculator for a (7, 4) cyclic Hamming code generated by the polynomial $G(p) = p^3 + p + 1$. Calculate the syndrome for Y = (1 0 0 1 1 0 1). Mention the advantages and disadvantages of cyclic code.

15. a) Discuss the principle of operation of DSSS scheme with neat diagram.

(OR)

b) Explain the basic principle of code division multiple access.

PART – C **(1×15=15 Marks)**

16. a) An audio frequency signal $10\sin 2\pi \times 500t$ is used to amplitude modulate a carrier of $50\sin(2\pi \times 10^5 t)$

Calculate :

i) Modulation Index

ii) Sideband frequencies

iii) Amplitude of each sideband frequencies

iv) Bandwidth required

v) Total power delivered to the load of 600Ω.

(OR)

b) Binary data is transmitted at a rate of 10^6 bits/second over a channel having a bandwidth 3 MHz. Assume that the noise PSD at the receiver is $\frac{N_o}{2} = 10^{-10}$ watts / Hz . Find the average carrier power required at the receiver input for coherent PSK and DPSK signalling schemes to maintain a probability of error $P_e = 10^{-4}$.

———————