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

Question Paper Code : X 60449

B.E./B.Tech. DEGREE EXAMINATIONS, NOV./DEC. 2020
Fifth Semester
Electronics and Communication Engineering
EC 2301/EC 51 – DIGITAL COMMUNICATION
(Regulations 2008)
(Common to PTEC 2301 – Digital Communication for B.E. (Part-Time) Fourth Semester – Electronics and Communication Engineering – Regulations 2009)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Draw a typical digital communication system.

2. How can BER of a system be improved ?

3. State Nyquist sampling theorem.

4. Why is quantisation needed in coding the samples ?

5. Define constraint length of a convolutional code.

6. State any two requirements of line codes.

7. Mention two properties of matched filter.

8. What is the use of eye pattern ?

9. A BPSK system makes errors at the average rate of 100 errors per day. Data-rate is 1 kbps. The single-sided noise power spectral density is 10^{-10} W/Hz. Assuming the system to be wide sense stationary, what is the average bit error probability.

10. What is meant by memoryless modulation ?

PART – B **(5×16=80 Marks)**

11. a) i) Explain the various analog pulse communication system describing their advantages and drawbacks. **(8)**

ii) Describe how channels can be classified and briefly explain each. **(8)**

(OR)

b) i) Describe the elements of a digital communication system. **(8)**

ii) Explain the mathematical models of various communication channels. **(8)**

12. a) Describe temporal and spectral waveform encoding methods. **(16)**

(OR)

b) Explain the process of quantization and obtain an expression for signal to quantization ratio in the case of a uniform quantizer. **(16)**

13. a) Derive the expression for power spectral density of unipolar NRZ line code. Hence discuss its characteristics.

(OR)

b) i) Design a block code for a message block of size eight that can correct for single errors. **(6)**

ii) Design a convolutional coder of constraint length 6 and rate efficiency $\frac{1}{2}$. Draw its tree diagram and trellis diagram. **(10)**

14. a) i) Explain the bit synchronisation. **(10)**

ii) Write notes on eye diagram. **(6)**

(OR)

b) Discuss Nyquist solutions to eliminate ISI.

15. a) Derive the expressions for bit error probability of the following receivers :

i) Coherent ASK **(8)**

ii) Non-coherent FSK. **(8)**

(OR)

b) Derive the expressions for the bit error probability of the following receivers.

i) QPSK. **(8)**

ii) Coherent PSK. **(8)**