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B.TECH. DEGREE EXAMINATION, MAY 2014

Sixth Semester

Branch : Electronics and Communication Engineering

EC 010 601 – DIGITAL COMMUNICATION TECHNIQUES (EC)

(New Scheme – 2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*

Each question carries 3 *marks.*

1. What is Correlation? Explain the different types.
2. Explain a ML Receiver.
3. What is Companding? Explain.
4. What is the need of equalizer in digital transmission? Briefly explain.
5. Explain about BPSK Signal.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. Write the differences between :
   (a) Sample function and Random process.
   (b) Wide sense stationarity and Strict sense stationarity.
7. Write the properties of matched filter receiver.
8. With a diagram, explain the generation of PPM Signal.
9. Explain modified duobinary signalling scheme.
10. Explain about Trellis coded modulation.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*

Each question carries 12 *marks.*

11. With a suitable example, explain Gram-Schmidt orthogonalization procedure.

(12 marks)

Or

12. (a) Derive the mean and auto correlation function at the output of a LTI System when a Stationary random process X (t) is given at the input.

(b) Write the properties of P.S.D.

(8 + 4 = 12 marks)

13. (a) With a neat block diagram, explain the operation of a matched filter receiver.

(b) Briefly explain a method to detect signals with unknown phase in noise.

(7 + 5 = 12 marks)

Or

14. (a) Derive the likelihood equation of ML estimation.

(b) Write the difference between Correlation receiver and a Matched filter receiver.

(7 + 5 = 12 marks)

15. State and prove Sampling theorem.

(12 marks)

Or

16. (a) With an example, explain quantization in PCM.

(b) Explain with a block diagram, the working of adaptive delta modulator.

(6 + 6 = 12 marks)

17. What is ISI? What is the reason for ISI? Explain the Nyquist criterion for distortionless base band binary transmission.

(12 marks)

Or

18. (a) Explain the following :

(i) Bit synchronization.

(ii) Frame synchronization.

(b) What is eye pattern? Explain.

(8 + 4 = 12 marks)

19. Draw the transmitter, receiver block diagrams of BFSK system. Also write the basis functions, signal constellation points and also draw the signal space diagram.

(12 marks)

Or

20. Explain :

(i) M-asy PSK system.

(ii) M-asy QAM.

(6 + 6 = 12 marks)

(5 × 12 = 60 marks)