

**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-ary PSK system.  
(ii) M-ary QAM. (6 + 6 = 12 marks)

[5 × 12 = 60 marks]