

Con/5793-07.

BB-7446

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) Assume **suitable** data if **necessary**.
 (4) **Figures** to the **right** indicate **full** marks.
1. (a) Show that the decoder for a Hamming code fails if there are two or more transmission errors in received sequence. 6
 (b) Explain the viterbi algorithm for decoding of convolution code. 6
 (c) The general polynomial of a (7,4) cyclic code is $g(x) = 1 + x + x^3$. Find 16 code-words. Also design an encoder for this code and verify its operation using message vector (0 1 0 1). 8
 2. (a) Explain in brief Nyquist criterion for zero ISI. Define roll off factor and vestigial spectrum for it. 10
 (b) Explain effect of signal characteristics on the choice of channel model. 10
 3. (a) Discuss mean square error criterion and MSE algorithm. 14
 (b) Compare linear equalization with adaptive linear equalization schemes. 6
 4. Write detail note on any **two** : 20
 (a) Fading multipath channels
 (b) Multicarrier communication system
 (c) Kalman filter.
 5. (a) Discuss the concept of spread spectrum techniques. 10
 (b) Describe the working of adaptive equalizer with feedback system. 10
 6. (a) Describe diversity techniques for fading multipath channels. 10
 (b) Compare performance of hard decision and soft decision decoding. 10
 7. (a) Explain convergence properties of LMS algorithm. 10
 (b) Explain working of Preset equalizer with neat sketch. What are disadvantages of Preset equalizer. 10