

DE-5417/5418

B. E. - III (Sem. VI) (E & C) Examination

November / December - 2006

Satellite Communication

Time : 3 Hours]

[Marks : 100

DE-5417

Instructions :

(1)

નીચે દર્શાવેલ વિગતોનું ચિત્રણ ઉત્તરવહી પર અચૂક ભરવો.
 Fillup strictly the details of signs on your answer book.

Name of the Examination :
 B. E. - 3 (Sem. 6) (E & C)

Name of the Subject :
 Satellite Communication

Subject Code No. : 5 4 1 7 Section No. (1, 2,.....) : 1

Seal: [] [] [] []
 Signature: _____

- (2) Figures to the right indicate full marks.
- (3) All symbols carry usual notations.
- (4) Assume suitable data if found necessary clearly indicating assumption made.
- 1 (a) Define following terms : 4
- (i) Prograde
- (ii) Retrograde
- (iii) Apogee
- (iv) Perigee.
- (b) List the advantages of digital over analog 6
satellite communications.
- (c) What is Entropy ? Explain it with example 6
avg information per message
- 2 (a) Find the capacity of Binary symmetric channel 8
shown below fig. 1.

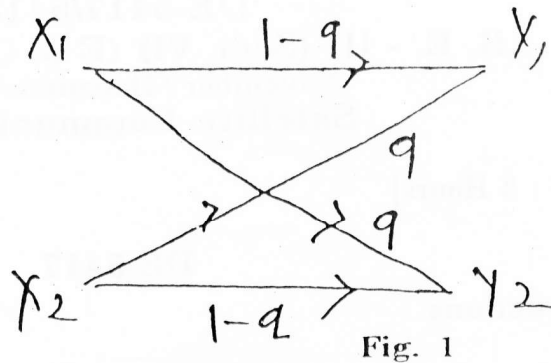


Fig. 1

Where q is the probability of error.

- (b) Construct a (7, 4) cyclic code using a polynomial (generator) $g(x) = x^3 + x^2 + 1$. 8

OR

- 3 (a) Consider a generator matrix G of a code given by 8

$$G = \begin{bmatrix} 1 & 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

Determine parity matrix of the code and show that

$HG^T = 0$ where H is the parity check matrix.

- (b) Design a binary huffman code for a discrete source of independent symbols α_1 , B and γ with probabilities 0.9, 0.08 and 0.02 respectively, determine : 8
- (i) Coding efficiency
 - (ii) Compression ratio
 - (iii) Average length of the code
 - (iv) Entropy of a source.

$$2(0.1) + 2(0.9) = 1.1$$

- 3 Attempt any three : 18

- (a) MSK transmitter and receiver
- (b) FSK demodulation; Coherent and non coherent detection
- (c) QPSK demodulation
- (d) DPSK transmitter and receiver.

0.90 0.9 0
 0.08 10 0.1 1
 0.02 11
 0.90 → 1
 0.08 → 2
 0.02 → 2

DE-5418

Instructions :

(1)

नीचे दशांकित विस्तार गयी विषयों के उत्तरों पर अवश्य दशांकित करें। Fillup strictly the details of signs on your answer book.		Seat No.:	
Name of the Examination:		□ □ □ □ □ □	
← B. E. - 3 (Sem. 6) (E & C)		Student's Signature	
Name of the Subject:			
← Satellite Communication			
← Subject Code No.:	5 4 1 8	← Section No. (1, 2.....):	2

- (2) Figures to the right indicate full marks.
(3) All symbols carry usual notations.
(4) Assume suitable data if found necessary clearly indicating assumption made.

- 4 (a) Draw and explain basic block diagram of satellite earth station. 8
(b) Explain transmitter and receiver of speech predictive encoded communication system. 6
- 5 (a) What do you mean by pre-assigned and demand assigned operations? Explain them with SCPC-FDMA digital satellite system. 10
(b) Explain transmit side burst processing in TDMA. 6

OR

- 5 (a) Explain receiver side burst processing in TDMA. 6
(b) Explain the different methods of steering the antenna automatically. 8
(c) Explain in brief preamble and postamble. 2
- 6 Write short notes : (attempt any three) 18
(a) Parametric LNA
(b) Carrier recovery in single tuned ckt
(c) Basic arrangement for detection of unique word
(d) Digital speech interpolation
(e) Timing relationship in a TDMA system.