

BB-5417-5418

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

May / June - 2006

Satellite Communication

Time : 3 Hours]

[Total Marks : 100

BB-5417

Instructions :

(1)

नीचे दृशविले निशान्नीवाणी विगतो उत्तरवडी पर अवश्य लपवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. III (Sem. VI) (E & C)

Name of the Subject :
Satellite Communication

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

Seat No. :
1 0 5 1 6 1

Student's Signature

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

- 1 (a) Describe the information of an event in brief. Also explain mutual information. 6
(b) Define the following terms : 4
(i) True anomaly
(ii) Mean anomaly
(iii) Retrograde orbit
(iv) Inclination.
(c) Explain Geo-stationary orbit conceptually. 6
- 2 (a) A zero memory source emits messages m_1 and m_2 with probability 0.2 and 0.8 respectively. Find the optimum binary code (hyffman) for its third order ($N = 3$) extrusion. Find word length and efficiency of the same. 8

- (b) Consider a (6, 3) linear block code with parity check matrix H given by 8

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

- (i) Find generator matrix G .
(ii) Find the code word for data bit 101.

OR

- 2 A (6, 3) linear block code is generated according to the generator matrix : 16

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

For a particular code word transmitted, the received code word is 100011. Find the corresponding data word transmitted using any method you know. Clearly mention the method you select.

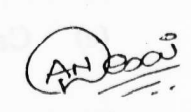
- 3 Attempt any three : 18

- (a) Convolutional codes
(b) Principle of operation of MSK
(c) NLQ-QAM modulators
(d) DQPSK demodulator
(e) Differential encoder & decoder for QPSK and OK-QPSK modems.

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Instructions :

(1)

<p>नीचे दशांश देल ← निम्नानुवाणी विगतो उत्तरवही पर अवश्य लयवी. Fillup strictly the details of ← signs on your answer book.</p> <p>Name of the Examination : <input style="width: 90%;" type="text" value="B. E. III (Sem. VI) (E & C)"/></p> <p>Name of the Subject : <input style="width: 90%;" type="text" value="Satellite Communication"/></p> <p>Subject Code No. : <input style="width: 20px;" type="text" value="5"/> <input style="width: 20px;" type="text" value="4"/> <input style="width: 20px;" type="text" value="1"/> <input style="width: 20px;" type="text" value="8"/> ← Section No. (1, 2,.....) : <input style="width: 20px;" type="text" value="2"/></p>	<p>Seat No. : <input style="width: 20px;" type="text" value="1"/> <input style="width: 20px;" type="text" value="0"/> <input style="width: 20px;" type="text" value="5"/> <input style="width: 20px;" type="text" value="1"/> <input style="width: 20px;" type="text" value="6"/> <input style="width: 20px;" type="text" value="1"/></p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">  Student's Signature </div>
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- (2) Figures to the right indicate full marks.
- (3) All symbols carry usual notation.
- (4) Assume suitable data if found necessary, clearly indicating assumption made.

- 4 (a) What is the importance of unique word in TDMA frame ? Discuss unique code detection and determine the miss probability for $N = 40, E = 5, P = 10^{-3}$ 10
- $$P = \sum_{I=E+1}^N \frac{N!}{I! (N-I)!} P^I (1-P)^{N-I}$$
- (b) Describe the classification of earth station antennas on the basis of radiation system. 6
- $$= \sum_6^{40} \frac{40!}{6! (35)!} (10^{-3})^6 (1-10^{-3})^{35}$$
- 5 (a) Explain the importance of LNA in satellite earth station. 6
- (b) Explain the demand assigned FDMA system used in SCPC-FDMA digital satellite system. 8
- (c) Concept of CDMA and its subsets. 2

OR

- 5 (a) Explain basic TDMA architecture. Show the TDMA frame organization and satellite channels in INTELSET-V TDMA systems. 10
- (b) Explain reference burst used in TDMA. 6

6 Write short notes : (any three)

18

- (a) Multiple access schemes used in satellite communication.
 - (b) SCPC channeling scheme for 36 MHz transponder.
 - (c) Basic equipments used in TDMA system.
 - (d) Frame and burst formats for TDMA system.
 - (e) Cassegrain antenna with its feed assembly.
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