



RE-7081-82

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

May / June - 2008

Satellite Communication : Paper - II

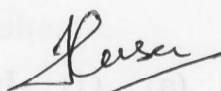
Time : 3 Hours]

[Total Marks : 100

RE-7081

Instructions :

(1)

नीचे दशांशविक निशानीवाणी विगतो उत्तरवही पर अवश्य कर्णी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	6 0 6 0 1 5
B. E. - 3 (Sem. 6) (E&C)	 Student's Signature
Name of the Subject :	
Satellite Communication - 2	
Subject Code No. : 7 0 8 1	Section No. (1, 2,.....) : 1

- (2) Q. 1 is compulsory in section 1 and Q. 4 is compulsory in section 2.
- (3) Draw neat and clean diagram wherever needed.
- (4) Write both the sections in different answer sheets.
- (5) Consider necessary assumption if required.

- 1 (a) Attempt all the questions : 20
  - (1) If distance  $D_1$  of satellite 1 is greater than distance  $D_2$  of satellite 2 then, 1  
(a)  $V_1 < V_2$  (b)  $V_1 > V_2$  (c)  $V_1 = V_2$
  - (2) \_\_\_\_\_ often provide a search and rescue service. 1  
(a) FSS (b) MSS (c) NSS
  - (3) For global positioning system \_\_\_\_\_ satellite service is used. 1  
(a) FSS (b) MSS (c) NSS
  - (4) Write down the condition of eccentricity for a circular orbit. 1
  - (5) \_\_\_\_\_ band is used for mobile satellite service and navigation system : 1  
(a) VHF (b) UHF (c) L
  - (6) Explain Kepler's 2nd law. 3
  - (7) Explain different radiation patterns. 3
  - (8) Explain Apogee and Perigee and also write down the equations of apogee and Perigee height. 3

RE-7081-82]

1

[Contd...

- (b) Explain below terms in detail : 6
- (1) Information
  - (2) Entropy
  - (3) The Geostationary orbit.
- 2 (a) (1) An uplink at 14 GHz requires a saturation flux density of  $-91.4 \text{ dBW/m}^2$  and an input back off of 11 dB. The satellite G/T is  $-6.7 \text{ dB/K}$  and receiver feeder losses amount to 0.6 dB. Calculate the carrier to noise density ratio. 5
- (2) Calculate the gain of a 3-m paraboloidal antenna operating at a frequency of 12 GHz. Assume an aperture efficiency of 0.5. 2
- (b) Generate code tree for input data 11010. Use convolutional encoder only. 8

**OR**

- 2 (a) (1) In a link budget calculation at 12 GHz, the free-space loss is 206 dB, the antenna pointing loss is 1 dB, and the atmospheric absorption is 2 dB. The receiver G/T ratio is  $19.5 \text{ dB/K}$  and receiver feeder losses are 1 dB. The EIRP is 48 dBW. Calculate the carrier to noise spectral density ratio. 5
- (2) A satellite downlink at 12 GHz operates with a transmit power of 6 W and an antenna gain of 48.2 dB. Calculate the EIRP in dBW. 2
- (b) Determine the Huffman code for the following messages with their probabilities given : 8

M1	M2	M3	M4	M5	M6	M7
0.05	0.15	0.2	0.05	0.15	0.3	0.1

- 3 Write the short notes on any three : 15
- (1) Feeder losses, fixed atmospheric and Ionospheric losses
  - (2) Thermal control
  - (3) The wide band receiver
  - (4) Geostationary orbit
  - (5) Input and output back off.

**Instructions :**

(1)

नीचे दशांशों में निशानोंवाली विंगती उत्तरवही पर अवश्य लખवी. Fillup strictly the details of signs on your answer book.		Seat No.:
Name of the Examination : <b>B. E. - 3 (Sem. 6) (E&amp;C)</b>		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Name of the Subject : <b>Satellite Communication - 2</b>		Student's Signature
Subject Code No. : <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Section No. (1, 2,.....): <input type="text"/>	

- (2) Q. 1 is **compulsory** in section 1 and Q. 4 is **compulsory** in section 2.
- (3) Draw neat and clean diagram wherever needed.
- (4) Write both the sections in **different** answer sheets.
- (5) Consider necessary assumption if required.

4 (a) Do as directed : 10

- (i) Explain what is meant by polarization interleaving.
- (ii) Explain the need for a reference burst in a TDMA system.
- (iii) Draw the phasor and constellation diagram of QPSK.
- (iv) Define MRTS service offered by MSAT.
- (v) A MATV system is used to provide reception of the DBS TV channels to small group of users. - true/false.

(b) Briefly describe the functioning of the BPSK transmitter with the necessary circuit and waveform. 6

5 Attempt any two : 16

- (a) With the aid of a block schematic, describe the functioning of a transmit-receive earth-station used for telephone traffic.

- (b) With the aid of a block diagram, describe the detection of the unique word.
- (c) Discuss the channeling scheme for the SPADE system.

**6** Briefly discuss the following : (any **three**) **18**

- (i) QPSK demodulator
- (ii) MSAT system
- (iii) Preassigned SCPC-FDMA
- (iv) Loopback timing control acquisition
- (v) Master Antenna TV system.