



5487/5488

B. E. III (Sem. VI) ECC Examination

October / November – 2005

Satellite Communication

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दर्शाविए निशानीवाणी विगतो उत्तरवही पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.		Seat No.:
Name of the Examination : B. E. III (Sem. VI) (ECC)		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Name of the Subject : Satellite Communication		Student's Signature
Subject Code No. : 5 4 8 7	Section No. (1, 2,.....) : Nil	

- (2) Attempt **all** the questions in both the sections.
- (3) Figures to the **right** indicate **full** marks.
- (4) Answers to the **two** sections must be written in **separate** answer books.
- (5) Assume **necessary** data wherever required.

1 Attempt any **four** :

16

- (1) What do you mean by active satellite and passive satellite ? Give the classification of the satellite on the bases of their orbit.
- (2) Explain in brief discrete memoryless source.
- (3) What is spectrum and spectrum efficiency of BPSK system ?
- (4) Define look angles in satellite communication.
- (5) An antenna has a noise temp. of 35 K, and is matched into a receiver which has a noise temperature of 100 K. Calculate :
 - (a) the noise power density and
 - (b) the noise power for a bandwidth of 36 MHz.
- (6) For an equivalent noise B.W. of 10 MHz and a total noise power of 0.0276 PW. Determine the noise density and equivalent noise temperature.

- 2 (a) Explain the principle of operation of NLA-QAM modulators with block diagram 8
- (b) How DQPSK differ from DEQPSK ? Explain in detail DQPSK with block diagram. 8

OR

- 2 (a) Describe the decoding process for the cyclic code. 8
- (b) Explain in detail fast frequency shift keying. 8
- 3 (a) Consider a (7, 4) block code generated by : 6

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

Explain how the errors syndrome S help in correcting a single error. Assume an information sequence $\bar{X} = [1101]$.

- (b) Complete the following link budget.

Uplink Parameter :

- (1) Earth station transmitter output power at saturation = 1 kW
- (2) Earth station back off loss = 3 db
- (3) Earth station total branching and feeder losses = 3db
- (4) Earth station transmit antenna gain for a 10 m parabolic disk at 14 GHz = -64 db
- (5) Free-space path loss for 14 GHz = 206.5 db
- (6) Additional uplink losses due to the earth's atmosphere = 0.8 db
- (7) Satellite transponder G/T = -4.6 d BK
- (8) Transmission bitrate, 90 Mbps, 8 Psk.

Downlink parameters :

- (1) Satellite X'mitter o/p power at saturation = 10 W
- (2) Satellite station X'mit antenna gain for a 0.5 m parabolic disk at 12 GHz = 30.8 db
- (3) Satellite modulation back - off loss = 0.8 db
- (4) Free space path loss for 12 GHz = 205.6 db
- (5) Additional downlink losses due to earth's atmosphere = 0.6 db
- (6) Earth station antenna gain for a 10 m parabolic disk at 12 GHz = 62 db
- (7) Earth station equivalent noise temp. = 200 K
- (8) Earth station branching and feeder losses = 0 db
- (9) Transmission bit rate, 90 Mbps, 8 Psk

Instructions :

(1)

नीचे दर्शाविए निशानीवाणी विगतो उत्तरवही पर अवश्य लખवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :

Name of the Subject :

Subject Code No. : Section No. (1, 2,.....) :

Seat No. :

Total Marks : 18

Student's Signature

- (2) Attempt **all** the questions in both the sections.
 (3) Figures to the **right** indicate **full** marks.
 (4) Answers to the **two** sections must be written in **separate** answer books.
 (5) Assume **necessary** data wherever required.

- 4 (a) Discuss the different elementary timing uncertainties that contribute to decide the guard time in TDMA. **6**
 (b) Classify the earth station antenna on the basis of radiation system and explain each in brief. **6**
 (c) Compare the cooled LNA and uncooled LNA. **4**

- 5 (a) Explain how a TDMA terminal is capable of processing a variety of terrestrial signal formats. Draw a TDMA terminal simplified block diagram and explain its primary elements. **8**
 (b) Explain Beacon receiver. **8**

OR

- 5 (a) Briefly describe the ways in which preassigned and demand assigned may be carried out in a FDMA network. **8**
 (b) "TDMA requires a method for precise timing of epochs of burst transmission." Justify this statment. Also explain the loop-back control method for acquisition and synchronization with the help of fig. **8**

- 6 Attempt any **three** short notes : **18**
 (1) Parametric LNA
 (2) Labelled signal flow diagram of HPA
 (3) Digital speech Interpolation
 (4) Transmit side burst processing
 (5) Basic block diagram of satellite earth station