



g. Which of the following is India's first operational satellite?

- (A) SITE (B) INSAT  
(C) APPLE (D) Aryabhata

h. Digital DBS-TV transmission takes place in

- (A) L-band (B) S-band  
(C) Ka-Band (D) Ku-band

i. Weather satellites employ

- (A) Polar orbit satellites (B) Geo-stationary satellites  
(C) Both of these (D) Either of these

j. A communication channel has a bandwidth of 5 kHz and if signal-to-noise ratio is 5, the corresponding channel capacity will be

- (A) 18000 bits/sec (B) 4000 bits/sec  
(C) 1500 bits/sec (D) 1000 bits/sec

**Answer any FIVE Questions out of EIGHT Questions.  
Each question carries 16 marks.**

**Q.2** a. Derive general link equations. Find the expressions for C/N and G/T ratios. (8)

b. Explain DBS method of transmission. (8)

**Q.3** a. Explain the following Time Division Multiplexing (TDM) and also T1-24 channel system. (8)

b. Explain the following:

(i) Direct Sequence Spread Spectrum Techniques (ii) Characteristics of PN sequence. (8)

**Q.4** a. Explain the antenna systems used in

(i) Earth stations (ii) Satellite stations (10)

b. A satellite located at 40,000 km from earth operates at a frequency of 11 GHz and has a EIRP of 21 dBW. If the receiving antenna has a gain of 50.5 dB, find the received power. (6)

**Q.5** a. Explain the block diagrams of Transmitter and Receiver sections of an Earth Station. (9)

b. Explain Cable transmission network and give cable TV frequencies. (7)

**Q.6** a. Explain the applications satellites with respect to Earth Observation and Weather Forecasting. (10)

b. Explain the function of Telemetry, Tracking and Command subsystem. (6)

- Q.7** a. Explain digital communication system and its use in satellite communication. **(10)**
- b. In a certain satellite communication link, the uplink carrier-to-noise  $(C/N)_u$  is 25 dB whereas the downlink carrier-to-noise ratio  $(C/N)_d$  is 20 dB. Find the Link carrier-to-noise ratio  $(C/N)$ . **(6)**
- Q.8** a. Explain Very Small Aperture Terminal (VSAT). **(8)**
- b. Explain the block diagram of conventional satellite repeater **(8)**
- Q.9** Explain the following: **(2 × 8=16)**
- (i) Satellite TV.
- (ii) INSAT-II