

**B.Tech. - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING
(BTECVI)**

**Term-End Examination
December, 2016**

00333

BIELE-018 : SATELLITE AND TV ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks. Any missing data, may be suitably assumed. Use of scientific calculator is permitted.

1. (a) Write down the advantages of Digital satellite communication systems. Why is synchronization required in TDMA system ? 5
- (b) A geostationary satellite carries a transponder with a 20 Watt transmitter at 4 GHz. The transmitter is operated at an output power of 10 Watts and drives an antenna with a gain of 30 dB. An Earth station is at the centre of the coverage zone of the satellite, at a range of 38,600 km. Using decibels for all calculations, find
- (i) the flux density at the Earth station in dBW/m^2 , and
- (ii) the power received by an antenna with a gain of 39 dB in dBW. 5

2. (a) Draw and explain the functional block diagram of an Earth station transmitter. 5
- (b) Explain the different types of demand assignments in satellite communication systems. 5
3. (a) Calculate the path loss in dB for a 2000 km path at 1.6 GHz, 2.5 GHz and 29 GHz operating frequencies. 5
- (b) Describe the various types of scanning in a television system. 5
4. Explain how attenuation and cross-polarization interference is induced by rain in satellite communication systems. 10
5. (a) Describe carrier recovery circuit with a single tuned circuit having AFC. 5
- (b) Draw and explain the block diagram of Phase-Lock Loop (PLL). 5
6. (a) Justify the choice of 625 lines for TV transmission. Why is the total number of lines kept odd in all television systems? 5
- (b) Explain the following colour television terms : 5
- (i) Hue
- (ii) Saturation

7. (a) Discuss how a vidicon camera tube develops the video signal. 5
- (b) What is the basic principle of a camera tube ? Explain the precautions to be taken in TV picture tubes. 5
8. (a) Why is vestigial side-band required for picture transmission in TV systems ? 5
- (b) Explain the use of pre-emphasis in transmitter and de-emphasis in receiver systems. 5
9. Draw and explain the block diagram of a digital TV receiver. What are the advantages of NTSC over a SECAM system ? 10
10. Write short notes on any *two* of the following : 2×5=10
- (a) IF Demodulation
- (b) Concept of Plasma Screen
- (c) HDTV
- (d) Timing Recovery Circuit
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