

00660

**B.TECH. IN ELECTRONICS AND  
COMMUNICATION ENGINEERING (BTECVI)**

**Term-End Examination**

**June, 2013**

**BIELE-018 : SATELLITE AND TV ENGINEERING**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any seven questions. All question carry equal marks.*

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1. Explain the various frequency bands used in satellite communication system. Compare the merits and demerits of different bands. 10

2. (a) The apogee and perigee of an elliptical satellite orbits are 3000km and 200km. Determine the eccentricity, semi major axis and semi minor axis. 5

(b) A satellite is moving in a circular orbit at a height of 200km above the earth surface. Determine its orbital velocity. 5

Assume  $G = 6.67 \times 10^{-11} \text{Nm}^2/\text{kg}^2$

$m = 5.98 \times 10^{24} \text{ kg}$ . Radius of earth = 6370km.

3. Explain the working of a transponder with the help of work diagram. Why does the conversion in a transponder uses 'RF – RF' conversion instead of 'RF – IF – RF' ? **10**
4. (a) In a satellite communication link, the up link carrier to noise ratio  $(C/N)_U$  is 20 dB where as the down link carrier to noise ratio  $(C/N)_D$  is 25 dB. Find the overall link carrier to noise ratio  $(C/N)$  ? **5**
- (b) Explain how carrier is recovered using band pass filter and AFC loop ? **5**
5. Explain how a Vidicon camera tube develop the video signal ? Draw light transfer characteristics of such a tube and explain dark current that flows in bad resistance. **10**
6. (a) What do you understand by interlaced scanning ? Show that it reduces flicker and consesues bandwidth ? **5**
- (b) If the percentage interlace error is 25%. Calculate the delayed in the start of second field and explain how it affect quality of picture. **5**
7. Draw the block diagram of television transmitter and compare the design features employing high level modulation and low level modulation ? **10**

8. Draw a fully labelled block diagram of NTSC decoder and explain briefly how chroma signal is processed to obtain the original R, G and B colour signals ? 10
9. Write short notes (*any two*) : 10
- (a) HDTV
  - (b) CCTV
  - (c) Plasma Screen
10. (a) What is vestigial sideband transmission and why is it used for transmission of TV picture signals ? 5
- (b) Why is a portion of the lower sideband of AM picture signal is transmitted along with carrier and full USB ? 5
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