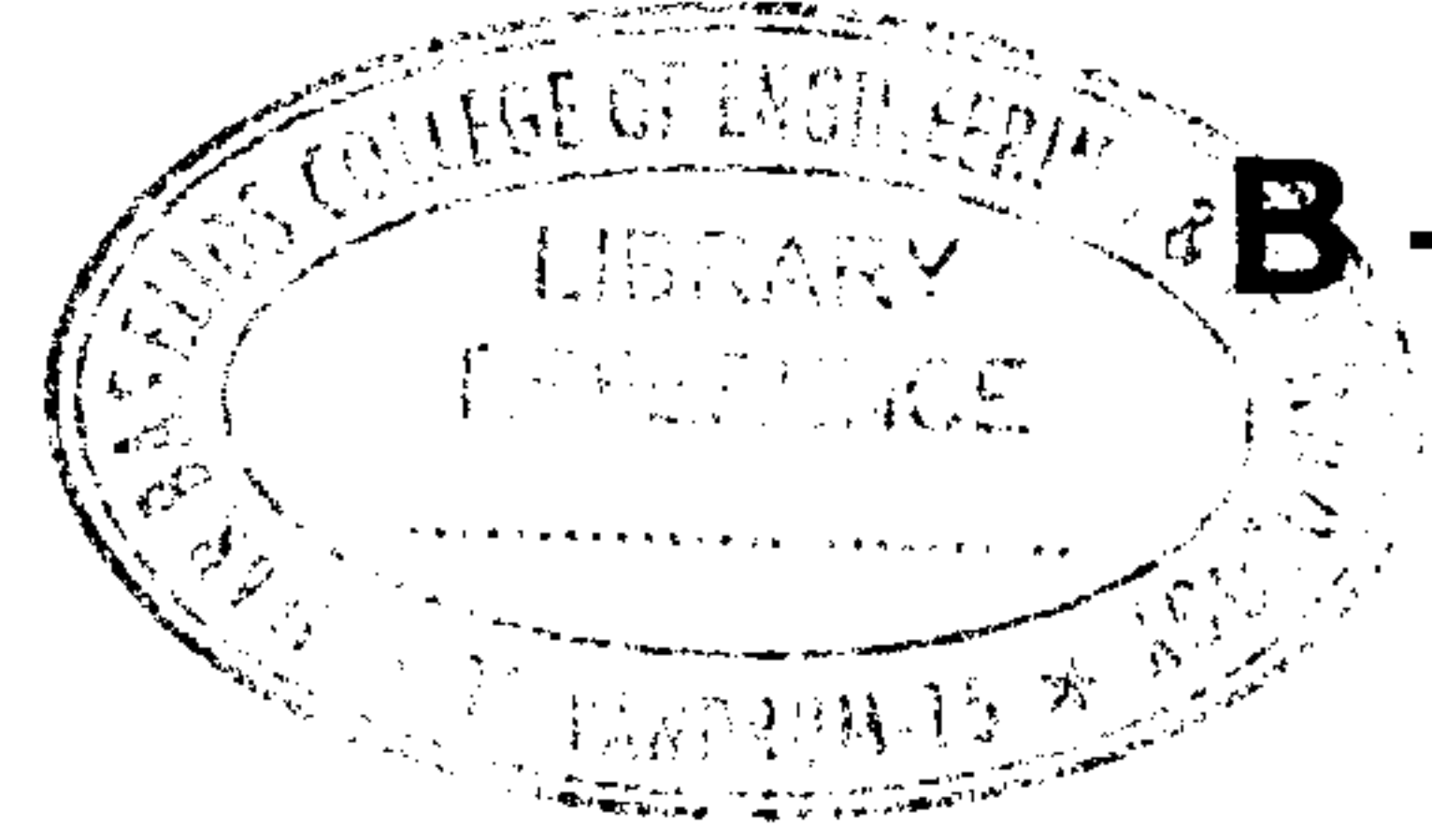




(Pages : 2)



**B – 2828**

Reg. No. : .....

Name : .....

**First Semester M.Tech. Degree Examination, December 2016  
(2008 Scheme)**

**ELECTRONICS AND COMMUNICATION ENGINEERING  
TTC 1006 : Wireless Communication**

Time : 3 Hours

Max. Marks : 100

**Instructions :** 1) Answer **any five** questions.  
2) **Each** question carries **20** marks.

1. a) State the frequencies used for satellite communication. Why uplink frequencies are higher than down link frequencies ? With a block diagram, describe the function of a transmit receive earth station used for telephony. 12
- b) 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) is 19.5 dB/K and the receiver feeder losses are 1 dB. The EIRP is 48 dBW. Calculate the carrier to-noise spectral density ratio. 8
2. a) Explain what is meant by geostationary orbit. How do the geostationary orbit and a geosynchronous orbit differ ? How is a satellite placed in the orbit ? 12
- b) Determine the limits of visibility for an earth station situated at mean sea level at latitude  $48.42^\circ$  north and longitude  $82.96$  degrees west. Assume a minimum angle of elevation of  $5^\circ$ . Given earth radius as 6371 Km and radius of circular orbit 42164 Km. 8
3. a) Explain the WLAN standards. Differentiate between Wi-fi and Wi MAX. 10
- b) List and briefly define Bluetooth baseband logic channels. What security services are provided by Bluetooth ? 10
4. a) Discuss the various hand off strategies in cellular networks. Differentiate soft hand off and hard hand off. How the coverage area and channel capacity increased for a cellular network ? 12
- b) Determine the channel capacity for a cellular telephone area comprised of seven macrocells with 10 channels per cell. Also find the channel capacity of each macrocell if split into 5 microcells. 8

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5. a) Discuss the channel capacity of MIMO system. **8**
- b) Discuss the parallel decomposition of the MIMO channel. Find the equivalent parallel channel model for a MIMO channel with channel gain matrix. **12**

$$H = \begin{bmatrix} 0.1 & 0.3 & 0.7 \\ 0.5 & 0.4 & 0.1 \\ 0.2 & 0.6 & 0.8 \end{bmatrix}$$

6. a) Differentiate GPS and DGPS. Discuss the GPS in detail. **10**
- b) Compare the power received in a reflection model and a free space model. **10**

