

EETC

**College of Engineering, Pune.**  
**End Semester Examination**  
**Broadband Communication (ET 408)**

Program: B. Tech. (Electronics and Telecommunication)

Year: 2012-13

Semester: VIII

Duration: 3 hours

Maximum Marks: 50

**Instructions:**

1. Attempt ALL questions.
2. Draw neat figures wherever required.

- Q 1 a)** What do you mean by fixed Wireless systems? State the typical radio spectrum allocations in context of fixed wireless systems. Also state the advantages and drawbacks of higher frequencies over lower frequencies in the RF domain. 5
- b)** Explain the two fixed wireless systems: i) LMDS ii) Microwave link. 5
- Q.2 a)** Draw the architectural schematic of Wi-MAX system. State the main features of Wi-MAX. 5
- b)** A geostationary satellite carries a C-band transponder which transmits 15 watts into an antenna with an on-axis gain of 32 dB. An earth station is in the center of the antenna beam from the satellite, at a distance of 38,500 km. For a frequency of 4.2 GHz:
- a. Calculate the incident flux density at the earth station in watts per square meter and in dBW/m<sup>2</sup>.
  - b. The earth station has an antenna with a circular aperture 3 m in diameter and an aperture efficiency of 62%. Calculate the received power level in watts and in dBW at the antenna output port.
  - c. Calculate the on-axis gain of the antenna in decibels.
  - d. Calculate the free space path loss between the satellite and the earth station. Calculate the power received,  $P_r$ , at the earth station using the link equation  $P_r = P_t G_t G_r / L_p$  where  $P_t G_t$  is the EIRP of the satellite transponder and  $L_p$  is the path loss. Make your calculation in dB units and give your answer in dBW. 5

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- Q 3 a)** State and compare the main features of the three versions viz. a, b and g of IEEE 802.11 standard for wireless LAN. **5**
- b)** Explain the phenomena of 'Eclipse' and 'Sun Transit Outage' occurring on a satellite. State the steps to be taken by ground monitoring stations in such situations. **5**
- Q.4 a)** Draw and explain the architecture of FTTH system. State the major advantages and drawbacks of FTTH compared to other means of broadband communication. **5**
- b)** State the main features and standards used in the 2G, 2.5G, 3G and 4G generations of cellular communication systems. **5**
- Q.5 a)** What is PON? State the major types of PONs. State main features of any two types of PONs. **5**
- b)** What is 'Quality of Service (QoS)' in relation to broadband communication? State the major parameters for evaluating QoS and their benchmarks that the service providers are expected to meet in order to assure QoS to broadband subscribers, as stated by TRAI. **5**

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