23/11/2015 ME ET-Sem II-CBGS-M&MWCS

QP Code : **30090**

(3 Hours) [Total Marks

N.B. : (1) Question no. 1 is **compulsory.**
(2) Solve any **three** questions from the remaining **five** questions.
(3) **Assume** suitable **data** if required.

1. (a) What is power efficiency of a modulation scheme? Why is it important at millimeter wave frequencies.
   (b) What is beam switching array?
   (c) Explain importance of axial ratio in polarization diversity.
   (d) What is meant by coexistence with wireless backhual?

2. (a) Discuss a system link budget to calculate the signal power and noise figure for a cascaded system.
   (b) Express N= KTB, input noise power in dBm and determine the noise power for an equivalent noise bandwidth of 10 MHz.

3. (a) The line of-sight path distance between the transmitting and receiving antennas of a microwave communication link is 14.4 km. If the path length of the ground reflected wave between the antennas is 18.6 km and the first Fresnel zone occurs at a height of 200 meters from the line- of sight path, determine the frequency of operation of the microwave link.
   (b) What is the need for beam-steering/ beam forming?

4. (a) Explain the significance of Eb/ No and SNR in total probability of error equation.
   (b) Draw and explain super heterodyning transceiver architecture.

5. (a) Explain spatial diversity of antenna arrays used in millimeter wave communication systems.
   (b) How noise coupling is achieved in millimeter wave system?

6. Write short notes on:-
   (a) Path loss using Friis equation.
   (b) Challenges faced by 60 GHz technology.
   (c) Path clearance and antenna heights.
   (d) S/N and C/N ratio
