

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1722703****Date: 12/07/2012****Subject Name: Radio Network Planning and optimization****Time: 10:30 am – 13:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What are the defining characteristics of 3G multi-service radio networks? Also explain the general challenges which are faced in radio network planning. **07**
- (b) Discuss in brief the 'WLAN standard's alphabet' and their main enhancements. **07**
- Q.2** (a) Discuss in detail radio network planning process for UMTS networks. **07**
- (b) If a signal - to - interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is $n=4$. Assume that there are six co- channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations. **07**

OR

- (b) With the help of suitable equations discuss the Uplink Radio Link Budget and Downlink Radio Link Budget for WCDMA networks. **07**
- Q.3** (a) Describe the influence of the inclusion of High-speed Downlink Packet Access (HSDPA) transmission on the radio link budgets. **07**
- (b) In a certain area there are 800 BSs. Each BS has three sectors with two frequency carriers used per sector. If we assume a maximum capacity of cells Radio Network Controller (RNC) = 1152 cells per RNC and a fillrate1 of 90%, determine the number of RNCs needed. **07**

OR

- Q.3** (a) What are the general requirements for a Radio Network Planning (RNP) tool for WCDMA Networks? **07**
- (b) Discuss in detail the iterative traffic-planning process for WCDMA networks. **07**
- Q.4** (a) With the help of suitable diagram explain Uplink inner-loop Power Control during diversity handover. **07**
- (b) What do you mean by Handover Control? Discuss in detail Intra-system–Intra-frequency Soft Handover. **07**

OR

- Q.4** (a) With reference to congestion control, discuss the following in detail: (i) Admission Control (AC) (ii) Load Control (LC) (iii) Packet Scheduling (PS). **07**
- Q.4** (b) What are the Impacts of Fast Power Control and Soft Handover on Network Performance for WCDMA radio networks? **07**
- Q.5** (a) What are the major Radio Network Planning Issues for WCDMA–GSM network Co-planning? **07**
- (b) What are the techniques for improving capacity for the radio networks? **07**

OR

- Q.5** (a) With the help of suitable sketch explain the Telecom Management Network Model in detail. **07**
- (b) Explain in detail the radio access network optimization process and key performance indicators. **07**
