

**BE (ETC) PT-IV, 7<sup>th</sup> SEMISTER, FINAL EXAM., 2013**  
**WIRELESS AND MOBILE COMMUNICATION (ET 705)**

Time: 3 hrs.

Full Marks: 70

Answer any six questions taking three from each group.

All questions carry the same marks

Two marks are reserved for neatness in each half

**Group-A**

(Answer any **three** questions)

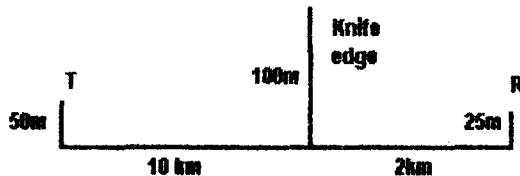
1. a) Discuss the concept of frequency reuse in cellular radio system. Why handoff strategy is important in mobile radio environment ? Discuss different techniques used for prioritizing handoffs.

b) Why the concept of trunking is important in cellular radio systems? Discuss briefly trunking and grade of service 7+4

2. What are the various sources of interferences that affect the performances of cellular radio systems? Discuss Co-channel Interference & system capacity of the same briefly with suitable illustrations & exhibits. 2+9

3. Discuss briefly with suitable illustrations and examples how the coverage and capacity in cellular systems can be improved through the following popular techniques: a) cell splitting b) sectoring and c) coverage zone approach. 11

4. What is diffraction in relation to electromagnetic signals? Explain the knife edge diffraction model for prediction of field strength in a given service area. Given the following geometry, determine : a) the loss due to knife- edge diffraction and b) the height of the obstacle required to induce 6dB diffraction loss. Assume  $f=900$  MHz.



4+3+4

5. Explain the phenomenon of flat and frequency selective fading in relation to multipath. Discuss Okumara model for signal prediction/fading in urban areas. How Hata Model can be developed from Okumara model? 5+3+3

P.T.O.

**Group- B**

(Answer any **three** questions)

6. What is the Telemetry system of a satellite ? How telemetry data are sent to a satellite ? Explain with necessary diagrams , the telemetry , tracking , command and monitoring system at a controlling earth station for a satellite . 2+3+6

7.Explain the functioning of a 6/4 and 14/11 GHz. Bent pipe transponder in satellite communications. What is M for N redundancy used in transponders? 4+4+3

8. What are earth stations in connecting with satellite communications? Explain the functioning of the transmitter and receiver used in the earth stations for satellite communications. 3+4+4

9.What are differences in link budgeting during uplink and downlink design in satellite communication? What are the factors which contribute to a worst case scenario during downlink design? What is link outage? 4+4+3

10. Explain the concepts of microscopic and macroscopic diversity related to small scale and large scale fading. Explain how maximal ratio combining can improve upon the fading aspects. What is equal gain diversity? 5+4+2

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