

G 214

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003.

Fourth Semester

Information Technology

IF 252 — TELECOMMUNICATION SYSTEMS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the intermediate frequencies of AM and FM Radios?
2. What is fading? What is its cause?
3. What are the two major interferences produced within a cellular telephone system?
4. What are the transmit and receive center frequencies for channel 3 of AMPS?
5. What are Low Earth Orbit Satellites? What is their main advantage?
6. What is the principle of LORAN Navigation?
7. Define Numerical Aperture of a fibre.
8. What are the most important characteristics of light detectors?
9. List out any four tones used in Telephone Systems.
10. Distinguish between Macro and Micro cells.

PART B — (5 × 16 = 80 marks)

11. What are the primary principles of ISDN? Describe the architecture of ISDN and ISDN-D channel and ISDN-B channel.
12. (a) (i) Draw the block diagram of a super heterodyne receiver and explain its various blocks. (8)
(ii) Derive an expression for RADAR range. (8)

Or

- (b) (i) Discuss about the radio propagation methods. Compare the performances.
- (ii) Define the terms Bandwidth, Beam width and Polarization relative to antenna.
13. (a) (i) Describe the basic cellular telephone concepts and frequency reuse.
- (ii) Determine the number of cells in a cluster and locate co-channel cells for the following values :

$$j = 2 \text{ and } i = 3.$$

Or

- (b) Draw and explain the forward control channel and reverse control channel formats of AMPS and explain in detail.
14. (a) (i) Draw the optical fibre communications system block diagram and explain.
- (ii) For a multimode SI fibre with glass core ($n_1 = 1.5$) and a fused quartz cladding ($n_2 = 1.46$), determine the critical angle, acceptance angle and numerical aperture.

Or

- (b) (i) Describe in detail about the optical transmitters and receivers with neat diagrams.
- (ii) For a single mode optical cable with 0.25 dB/km loss, determine the optical power, 100 km from a 0.1 mW source.
15. (a) (i) Describe Kepler's Laws and hence how the orbit of Geostationary satellites is estimated?
- (ii) Write a detailed note on the application of satellites for surveillance and navigation.

Or

- (b) (i) Draw the block diagram of an Earth station and explain the function of each block.
- (ii) What are the various Satellite subsystems? Explain their part in the satellite communication.