C 61468 (Pages 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, APRIL 2014

(2009 Scheme)

AI 09 L01—WIRELESS COMMUNICATION SYSTEMS

(Regular/Supplementary/Improvement)

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. Define apogee and perigee.
2. How many satellite transponders are required to interlink six earth stations with FDM/FM modulation ?
3. What is frequency hopped CDMA system ?
4. What is meant by frequency reuse ?
5. What are the different modulations used in WLAN ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. State Kepler's three laws of planetary motion. Illustrate in each case their relevance to artificial satellites orbiting the earth.
7. In a DSSS system the data sequence at the rate of 1000 bits/sec and the spread spectrum sequence has a chip rate of 10 MHz. Determine the processing gain and jamming margin for $E_b/N_0 = 10$ dB.
8. Explain the different steps involved in the handoff process.
9. Explain different methods used for improving capacity of a cellular system.
10. Explain the forward and reverse links in IS-95 system.
11. Explain FDMA, and show how this differs from FDM.

(4 × 5 = 20 marks)

Part C

Answer any **one** *question from each module.*

MODULE I

12. On a satellite down link, the C/No ratio is 86 dBHz and Eb/No of 12 dB is required at the earth station. Calculate the maximum bit rate that can be transmitted.

Turn over

13. (a) Mention few advantages and disadvantages of microwave radio.

    (b) Compare analog and digital microwave systems.

MODULE II

14. Explain the different spread spectrum techniques.

15. Briefly explain the evolution of cellular networks from 2G to 3G.

MODULE III

16. 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 (a) $n = 4$, (b) $n = 3$? 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.

17. Briefly discuss different outdoor propagation models in mobile radio propagation.

MODULE IV

18. What is multiple accessing ? Explain briefly the most commonly used multiple accessing arrangements clearly ?

19. Write short notes on a) WLAN b) Bluetooth.

(4 × 10 = 40 marks)