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K – 5573

Reg. No.

Name :

Eighth Semester B.Tech. Degree Examination, February 2021

13.804 : WIRELESS COMMUNICATIONS (T)

(2013 Scheme)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions :

1. Explain simulcast of paging service.
2. List out major functions of Mobile Switching Center.
3. Justify the choice of hexagon shaped cell structure in cellular systems?
4. What is meant by frequency re-use?
5. Determine the number of cells in clusters for the following values $j=4$ and $j=2$ and $j=3$ and $i=3$.
6. What is Brewster Angle?
7. What is meant by Jamming margin in a CDMA system?
8. Describe a technique to generate orthogonal carriers in OFDM.
9. Differentiate circuit switching and packet switching.
10. Define apogee and perigee.

(10 × 2 = 20 Marks)

P.T.O.



PART – B

Answer **any one** questions from **each** Module. Each carries **20** marks.

Module – I

11. (a) Differentiate simplex, half duplex and full duplex systems. 5
(b) With the help of timing diagram explain how a cellular telephone call is made. 15

OR

12. (a) Compare key features of major 2G systems(GSM and IS95). 10
(b) Describe (i) Bluetooth, and (ii) Zigbee. 10

(1 × 20 = 20 Marks)

Module – II

13. (a) Explain different methods used for improving coverage area of a cellular system. 10
(b) If the 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 (i) $n=4$, (ii) $n=3$? Assume 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. 10

OR

14. (a) With suitable diagrams explain GSM system architecture. 12
(b) Explain the hand-off strategies in mobile systems. 8

(1 × 20 = 20 Marks)



Module – III

15. (a) What is meant by fading? List out different types of fading. 10
(b) Explain different types of diversity techniques used to combat fading. 10

OR

16. (a) With suitable diagram explain the ground reflection model of mobile radio propagation. 10
(b) A mobile is located 5km away from a base station and uses a vertical $\lambda/4$ monopole antenna with a gain of 2.55dB to receive cellular radio signals. The E-field at 1km from the transmitter is measured to be 10^{-3} V/m. The carrier frequency used for this system is 900MHz.
(i) Find the length and effective aperture of the receiving antenna.
(ii) Find the received power at the mobile using the two ray ground reflection model assuming the height of the transmitting antenna is 50m and the receiving antenna is 1.5m above ground. 10

(1 × 20 = 20 Marks)

Module – IV

17. (a) Describe the commonly used multiple accessing arrangements (TDMA, FDMA and CDMA) with suitable diagrams. 12
(b) Illustrate the X.25 protocol of wireless networking. 8

OR

18. (a) Write short notes (i) GPRS, (ii) GPS. and (iii) UMTS. 9
(b) What are Geo stationary satellites? Explain the functions of a satellite transponder with block diagram. 11

(1 × 20 = 20 Marks)

