KUMARAGURU
college of technology
character is life

Register Number: …….

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Eighth Semester

ELECTRONICS & COMMUNICATION ENGINEERING

ECE135: Mobile Communications

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The channel used for voice transmission from Base station to mobile are called
   a) Forward Control channel b) Reverse control channel
   c) Forward voice channel d) Reverse voice channel
2. There are a total of 168 voice channels available in a cellular system configured with seven cell, three sector cluster pattern. Assuming the uniform distribution of channels in each sector, the number of voice channels in a sector is
   a) 18 b) 8
   c) 28 d) 80
3. Find the Fraunhofer distance for an antenna with maximum dimension of 2m and operating frequency of 900 MHz.
   a) 6m b) 24m
   c) 10m d) 8m
4. Flat fading will occur when
   a) $B_s < B_c$ b) $B_s > B_c$
   c) $B_s < B_D$ d) $B_s > B_D$
5. ECP means
   a) Executive cellular processor b) Equipment cellular processor
   c) Evaluation cellular process d) Erlangs cellular procedure
6. The name of the manufacturer of switching equipment is
   a) Nokia b) apple
   c) samsung d) Ericson

7. SDMA means
   a) Space division multiple access
   b) Small division multiple access
   c) Scale division multiple access
   d) Sign division multiple access
8. Interference effects in cellular are a result of
   a) The distance between areas
   b) The power of the transmitter
   c) The height of the antennas
   d) The ratio of the distance between the areas to the transmitter power of the area
9. Which of following is not a limitation of AMPS?
   a) Low calling capacity
   b) Poor privacy protection
   c) Limited spectrum
   d) Wide coverage area
10. I Phone is a trade name for which cellular company
   a) apple
   b) nokia
   c) apple
   d) Haier

PART B (10 x 2 = 20 Marks)

11. What is meant by hand off ? Why it is needed?
12. Determine the number users that can be supported by 10 trunked channels with 0.5 % blocking probability? Given the total offered traffic intensity for the given system as 1.13 and assume each user generates 0.1 erlangs of traffic.
13. What is the criterion for the selection of speech coders for mobile communication?
14. Determine the received power when the transmitter power is 10watts and carrier frequency is 2.4Ghz if the receiver is at a distance of 1.6Km from the transmitter? Assume that the transmitter and receiver antenna gains are 1.6 for a free space propagation model
15. Mention the various mobile phone antennas
16. Name signaling formats.
17. What is the multiple access used GSM system
18. Write the merits of FDMA.
19. Which type G (2G, 2.5G,3G,3.5G,4G) is used in GPRS?
20. What is the use multisim in mobile phones?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain with block diagram a cellular system when the call is initiated by the landline customer, how a cellular telephone call is made between the land line and the mobile user and when the call is initiated by the land line customer. (7)

(ii) What is grade of service? show how the Erlang B formula and Erlang C formula is used in cellular system (7)

(OR)

b) (i) Explain the frequency reuse concept and prove that $N= i^2+i\,j + j^2$ Where N is the number of cells per cluster (7)

(ii) Analyze and obtain an expression for signal to interference ratio (S/I) for 7 cell cluster system (7)

22. a) Compare the types of small scale fading. Explain each in detail

(OR)

b) Explain large scale fading. Derive the power received at a distance d in a ground reflection model

23. a) Compare the different techniques used for increasing the capacity and improving the coverage in cellular system.

(OR)

b) (i) Explain the various mobile antennas present in the cell site and cell towers with radiation characteristics and parameters. (7)

(ii) Explain the various cellular switching equipment present in the mobile telephone switching office. (7)

24. a) (i) Obtain efficiency in a frame structure of TDMA, also draw the frame structure of TDMA (7)

(ii) Derive an equation to calculate the number of users in a CDMA cellular systems (7)

(OR)

b) (i) Explain the procedure for real time co channel measurements (7)

(ii) Explain how near end and far end interferences arise in the wireless networks? Is there any method to reduce them if so explain the methods. (7)

25. a) Explain the architecture of GSM system using suitable block diagram and explain its channels.

(OR)

b) (i) Compare forward and reverse channels of IS-95 (7)

(ii) Distinguish between GSM and CDMA2000 (7)

****