CLASS: BE   SEMESTER : VII/ADD.
BRANCH: ECE   SESSION : MO/18

SUBJECT: EC7201-MOBILE AND CELLULAR COMMUNICATION

TIME: 03:00 Hrs.   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   Draw a common frame format used in GSM.   [2]
   (b)   Briefly explain wireless local loop (WLL) and local multipoint distribution services (LMDS).   [4]
   (c)   Explain different network architectures used in WLAN. Also, Describe the similarities between   [6]
         HiperLAN/2 and IEEE 802.11a.

Q.2(a)   Why an umbrella cell approach is needed?   [2]
   (b)   A large cell provides coverage over an area of 210 square km and support 45 voice channels. If this large   [4]
         cell is divided into 7 smaller cells, where each cell supports 30% of the total available channels. Find
         the total number of voice channels available to the system and coverage area of each cell.
   (c)   What do you mean by hand-off in a cellular system? Illustrate a handoff scenario at cell boundary using   [6]
         power level consideration.

Q.3(a)   What do you mean by downlink interference and uplink interference?   [2]
   (b)   Elaborate the estimation of signal to interference ratio in co-channel cells.   [4]
   (c)   Discuss power control methods to minimize the battery drain during transmission in case of CDMA digital   [6]
         cellular standard (IS-95).

Q.4(a)   Name any three outdoor-propagation models. Define coherence bandwidth.   [2]
   (b)   What do you mean by multipath propagation and multipath fading? Sketch diagrams to explain.   [4]
   (c)   A transmitting antenna having 30 m height transmits at 800 MHz frequency. Using two ray tracing model   [6]
         find the path loss at a receiver having 2 m height, at 10 km away from the transmitter. How much extra
         path loss occurs in two ray tracing model compared to free space propagation model?

Q.5(a)   How array gain is different from diversity gain?   [2]
   (b)   Assume five branch diversity is used, where each branch receives an independent Rayleigh fading signal.   [4]
         If the average SNR is 20 dB, determine the probability that the SNR will drop below 10 dB. Compute the
         mean SNR. Compare this with the case of a single receiver without diversity.
   (c)   How does maximum ratio combining function? Derive an expression to represent the average SNR   [6]
         improvement realized in maximum ratio combining?

Q.6(a)   Name any two antennas used for mobile communication and also explain the basic concept of an   [2]
         antenna.
   (b)   Discuss the fundamental design parameters of an antenna.   [4]
   (c)   What do you mean by smart antenna? How switched beam antenna is different from adaptive antenna   [6]
         array?

Q.7(a)   Explain multicarrier multiple access technique.   [2]
   (b)   A usual GSM time slot consists of 6 trailing bits, 8.25 guard bits, 26 training bits and two traffic burst of   [4]
         58 bits of data. Find the number of bits in a frame and the frame efficiency.
   (c)   What are the shortcomings of OFDM techniques? Discuss its solutions.   [6]

******28.11.18******M