June 6, 2024   10:30 am - 01:30 pm   1T01037 - B.E.(Electronics and Telecommunication)(SEM-VII) (Choice Base Credit Grading System) (R- 2019-20)(C Scheme) / 42472 - MOBILE COMMUNICATION SYSTEM   QP CODE: 10054713

Duration: 3hrs   **[Max Marks: 80]**

N.B. : (1) Question No 1 is Compulsory.
         (2) Attempt any three questions out of the remaining five.
         (3) All questions carry equal marks.
         (4) Assume suitable data, if required, and state it clearly.

1   Attempt any FOUR   **[20]**
   a   Why the shape of the cell is hexagaon ?   **[5]**
   b   Differentiate between Rayleigh distribution and Ricean distribution   **[5]**
   c   What is handoff ? state its types. Explain mobile assisted handoff.   **[5]**
   d   Explain the merits and demerits of a millimeter bands   **[5]**
   e   How power control is achieved in CDMA-2000 technology   **[5]**

2 a   If a transmitter produces 50 watts of power, express the transmitter power in   **[10]**
        units of
        (a) dBm and (b) dBW. If 50 watts is applied to a unity gain antenna with a
        900MHz carrier frequency, find a receiver power in dBm at a free space
        distance of 100m from the antenna. What is Pr (10km) ? Assume unity gain for
        the receiver antenna.
   b   Draw UMTS network architecture with interfaces and explain. Give   **[10]**
        specifications.

3 a   What is MIMO? State and explain its types with suitable diagram.   **[10]**
   b   Discuss factors influencing small scale fading.   **[10]**

4 a   Consider a transmitter which radiates sinusoidal carrier frequency of   **[10]**
        1850MHz. For a vehicle moving 60 mph, compute the received carrier
        frequency if the mobile is moving (a) directly towards the transmitter (b)
        directly away from the transmitter (c) in a direction which is perpendicular to
        the direction of arrival of the transmitted signal.
   b   Illustrate 3GPP core network architecture and explain functions of each block   **[10]**
        in detail.

5 a   Draw and explain GSM signaling protocol architecture   **[10]**
   b   Explain RAKE receiver .   **[10]**

6 a   What are the attributes of WCDMA system. Explain WCDMA channels.   **[10]**
   b   Write a note on (any TWO)   **[10]**
        i)   GSM frame structure
        ii) PAPR in OFDM
        iii) Beamforming

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