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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (AI&ML / CSE / DS / IT / Internet of Things and Cyber Security
including Block Chain / EE) (Sem.-7,8)**

MOBILE COMMUNICATION & NETWORKS

Subject Code : BTEC-908B-18

M.Code : 91013

Date of Examination : 01-01-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of TEN questions carrying TWO marks each.
2. **SECTION-B** contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. **SECTION-C** contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) What is mobile assisted hand off?
- b) What is the difference between dynamic channel and static channel assignment?
- c) Explain incremental redundancy in EDGE.
- d) Differentiate between large scale and small scale fading.
- e) What is cyclic prefix in OFDM?
- f) What is the advantage of spatial multiplexing?
- g) What is the need for equalization?
- h) Write a short note on WCDMA and CDMA2000.
- i) What is Rayleigh fading? In what scenario is a fading channel Rayleigh distributed?
- j) What is average fade duration?

SECTION-B

2. With the help of a diagram, explain the principle of RAKE receiver.
3. What is receive diversity? Discuss selection combining and maximal ratio combining.
4. Explain the concept of co-channel and adjacent channel interference. Describe the techniques to avoid interference.
5. How can we improve the capacity of a cellular network? Explain any two capacity expansion techniques.
6. What is the difference between space time block coding and spatial multiplexing? Discuss the diversity/multiplexing tradeoff in detail.

SECTION-C

7. Discuss the evolution of mobile phones from 2G to 5G.
8. With the help of diagram, explain the operation of OFDM transceiver. Also discuss the principle of working of OFDM by comparing it with FDMA.
9. Explain cell splitting and microcell zone concept for increasing the coverage and capacity in cellular systems. Discuss the drawbacks of microcell zone concept. A cellular service provider decided to use a digital TDMA scheme which can tolerate a signal-to-interference ratio of 15dB in the worst case. Find the optimal value of N for omnidirectional antennas, 120 sectoring and 60 sectoring. Should sectoring be used? If so, which case (60 degree or 120 degree) should be used? (Assume a path loss exponent of 4).

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.