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BTECH
(SEM VII) THEORY EXAMINATION 2023-24
WIRELESS & MOBILE COMMUNICATION

TIME: 3 HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief.

| Qno. | Question | Marks | CO |
|------|--|-------|----|
| a. | Illustrate the need to evolve third generation wireless standards. | 2 | 1 |
| b. | Write the name of channel assignment strategies in mobile radio propagation. | 2 | 1 |
| c. | Discuss characteristics of a pn sequence. | 2 | 2 |
| d. | Define the term vocoder. | 2 | 2 |
| e. | Illustrate the maximum throughput efficiency of Slotted ALOHA. | 2 | 3 |
| f. | Define equalization. | 2 | 3 |
| g. | Illustrate the terms SGSN and GGSN. | 2 | 4 |
| h. | Illustrate the function of Node B in UMTS. | 2 | 4 |
| i. | Explain the advantage of light fidelity. | 2 | 5 |
| j. | Discuss Wi-Fi communication in a cellular system. | 2 | 5 |

SECTION B

2. Attempt any three of the following:

| | | | |
|----|---|----|---|
| a. | Explain co-channel reuse ratio. Also derive the relationship between co-channel reuse ratio and cluster size. | 10 | 1 |
| b. | Illustrate slow FHSS and fast FHSS in detail. | 10 | 2 |
| c. | Illustrate CSMA and CSMA/CD with the help of proper flow diagram. | 10 | 3 |
| d. | Explain GPRS architecture in detail. Also explain the use of CCU and PCU unit in detail. | 10 | 4 |
| e. | Illustrate the advantage of NGN networks. | 10 | 5 |

SECTION C

3. Attempt any one part of the following:

| | | | |
|----|--|----|---|
| a. | If a signal to interference ration of 17 dBm is required for satisfactory forward channel performance of a cellular system, Calculate the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent (n) is 4, Assume that there are 6 co-channel cells in first tier and all of them are at the same distance from the mobile. Use suitable approximations. | 10 | 1 |
| b. | Explain Frequency Reuse concept with the help of proper cellular diagram. Also explain umbrella cell concept in mobile communication. | 10 | 1 |

4. Attempt any one part of the following:

| | | | |
|----|--|----|---|
| a. | Explain various types of vocoders with brief view of general voice generation mechanism. | 10 | 2 |
| b. | Explain various diversity techniques in wireless and mobile communication. | 10 | 2 |

5. Attempt any one part of the following:

| | | | |
|----|---|----|---|
| a. | Illustrate various equalization techniques with the help of proper block diagram. | 10 | 3 |
| b. | Compare FDMA, CDMA and TDMA in detail. | 10 | 3 |

6. Attempt any one part of the following:

| | | | |
|----|--|----|---|
| a. | Explain UMTS architecture in detail. Also briefly explain IMT 2000. | 10 | 4 |
| b. | Compare LEO, MEO, GEO. Also explain the timing diagram of call connection between two ISU units in mobile satellite communication. | 10 | 4 |

7. Attempt any one part of the following:

| | | | |
|----|---|----|---|
| a. | Discuss Mobile Ad-hoc Network (MANET) in detail. | 10 | 5 |
| b. | Write short note on (i) Wi-Max (ii) 4g technology | 10 | 5 |