M.Sc. Fourth Semester (Applied Electronics) (New) (CBS)
15059 : Mobile Communications : 4 AE 3

P. Pages : 2

Time : Three Hours

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Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Diagrams should be given wherever necessary.
4. Illustrate your answer necessary with the help of neat sketches.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) For a hexagonal cell geometry prove that the number of cell per cluster N can have values given by.

$$N = i^2 + ij + j^2$$

where i and j are +Ve integer.   7

b) Explain the concept of frequency reuse and how it improves capacity and spectral efficiency of cellular system.   7

OR

2. a) Why it is needed to have power control in cellular system and who controls the power?   7

b) What is hand-off? Explain how handoff occurs at cell boundary.   7

3. a) What is fixed and dynamic channel assignment strategies explain.   6

b) What are repeaters? How they are used for range extension of cellular system.   7

OR

4. a) A TDMA cellular system can tolerate a signal-to-interference ratio of 15dB in worst case. Find the optimal value of N for
 a) Omnidirectional antennas
 b) 120° sectoring
 (assume a path loss exponent of n = 4).   6

b) Explain cell splitting and how it reduces co-channel interference and increases cell capacity.   7

5. a) What is Brewster angle? Calculate Brewster angle for a wave impinging on ground having a permittivity of $\epsilon_r = 4$.   7

b) What is small scale fading? Explain in brief factors influencing small scale fading.   6

OR

6. a) Determine the maximum and minimum spectral frequencies received from a stationary GSM transmitter that has a center frequency of exactly 1950 MHz, assuming that the receiver is travelling at speed of (a) 1km/hr (b) 5km/hr (c) 100km/hr.   6

   b) What is diversity? How it is used to improve received signal quality and link performance over small scale times and distances.   7

7. a) Explain call processing in GSM.   7

   b) Explain forward CDMA channel modulation process.   7

<div align="center">OR</div>

8. a) What are different GSM channel types explain each in brief.   7

   b) Explain GSM system architecture with various interfaces used.   7

9. a) Discuss CT2 standard for cordless telephones.   7

   b) Explain DECT TDMA frame structure.   6

<div align="center">OR</div>

10. a) What is WLL (wireless local loop)? Explain LMDS architecture.   7

   b) Describe DECT architecture.   6

11. a) Explain CDPD architecture and give its features.   7

   b) What are different WLAN technologies? Explain each in brief.   6

<div align="center">OR</div>

12. a) Give features of bluetooth.   6

   b) Explain GPRS in brief.   7

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