

B.E.Eighth Semester (Electronics Telecommunication /  
Electronics Communication Engineering) (C.B.S.)  
**Wireless & Mobile Communication**

P. Pages : 2

Time : Three Hours



**NKT/KS/17/7562**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Illustrate your answers whenever necessary with the help of neat sketches.
  11. Use of non programmable calculator is permitted.
  12. Use of Erlang B and C chart/table as permitted.

1. a) What is frequency reuse concept ? Explain its importance while designing the cellular mobile system support yours answer with suitable example and mathematical parameters ? **7**
- b) Explain the following in brief. **6**
- i) Channel Assignment Strategies.
  - ii) Mobile Assisted Handoff (MAHO)

**OR**

2. a) What are different techniques use to improve coverage and capacity explain any one in detail. **6**
- b) A certain area is covered by a cellular radio system with 84 cells and clusters size N 300 voice channels are available for system. Uses are uniformly distributed over the area covered by the cellular system and offered traffic per uses is 0.04 Erlang, Assume that block calls are cleared and designated blocking probability is 1%. **7**
- i) Determine the max. carried traffic per call if N=4 is used.
  - ii) Determine max numbers of uses that can be served by the system for a blocking probability of 1% & N = 4.

3. a) Explain the following terms : **7**
- i) level crossing rate
  - ii) Coherence Band width
  - iii) Delay spread
  - iv) Rayleigh fading.
- b) For Rayleigh fading signal compute the positive going level crossing rate for  $\rho = 1$  when the max dopples freq (fm) is 20 Hz. What is the maximum velocity of the mobile for this Dopples if the carrier frequency is 900 MHz. **6**

**OR**

4. a) What is fading. Explain small-scale fading and large scale fading. **6**

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- b) Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz for a vehicle moving 60 mph, compute the received carrier frequency, if the mobile is moving. **7**
- i) Directly towards the transmitter
  - ii) Directly away from the transmitter
  - iii) In a direction which is perpendicular to the directions of arrival of the transmitted signal.
5. a) Draw block diagram of a simplified communication system using an adaptive equalizer at receiver and derive the expression showing equalizer is actually an inverse filter of channel. **7**
- b) Explain : **6**
- i) Frequency Diversity
  - ii) Polarization diversity

**OR**

6. a) Explain various space diversity reception techniques with their merits and demerits. **7**
- b) Write short note on : **6**
- i) Space diversity
  - ii) Time diversity
7. a) Explain in detail GSM system architecture and give its services and features. **9**
- b) What are the different data bursts used in GSM? Give bit format of each. **5**

**OR**

8. a) Explain in detail GSM control channels. **7**
- b) Explain speech signal processing in GSM. **7**
9. a) List and briefly explain the capabilities provided by mobile IP. **7**
- b) What are the services provided by WSP. **6**

**OR**

10. a) What are the requirements of WAP architecture. **4**
- b) Draw and explain WAP architecture. **9**
11. a) List and briefly define the IEEE 802 protocol layer. **6**
- b) Explain IEEE 802.11 services. **8**

**OR**

12. a) Draw and explain IEEE 802.11 architecture. **8**
- b) Write short note on : **6**
- i) Spread spectrum LAN.
  - ii) Narrow band microwave LAN.

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