



- 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. Diagrams and chemical equations should be given whenever necessary.
  11. Illustrate your answers whenever necessary with the help of neat sketches.
  12. Use of non programmable calculator is permitted.

1. a) With neat illustration explain hand-off strategies. 6
- b) Given a cellular system in which there are 1001 radio channels available for handling traffic. It is also given that the area of a cell is  $6 \text{ km}^2$  and the area of the entire system is  $2100 \text{ m}^2$ . 8
- i) Calculate the system capacity of the Cluster size is 7
  - ii) How many times would the Cluster of size 4 have to be replicated in order to approximately cover the entire cellular area
  - iii) Calculate the system capacity if the cluster size is 4.
  - iv) Does decreasing the cluster size increase the system capacity? Explain.
- OR**
2. a) Explain the following terms. 6
- |                            |                   |
|----------------------------|-------------------|
| i) Umbrella cell approach. | ii) Cell dragging |
| iii) Holding time          | iv) Dwell time    |
| v) Grade of service (GoS)  | vi) Set up time.  |
- b) Explain the following capacity improvement technique used in cellular system. 8
- i) Cell splitting
  - ii) Microcell zone concept.
3. a) What is the difference between fast and slow fading. 7
- b) Explain how the speed of mobile influence small scale fading and what is Doppler effect. 6
- OR**
4. a) Explain the following terms. 8
- i) Level crossing rate
  - ii) Coherence Bandwidth
  - iii) Delay spread
  - iv) Rayleigh fading.
- b) Explain small scale fading. Give type of small scale fading. 5

5. a) What do you mean by Euclidean distance? Explain and find Euclidean distance for QPSK. 6  
b) Explain BPSK Transmitter and Receiver. 7

**OR**

6. a) Explain G. MSK with the help of following. 7  
i) Brief Introduction to GMSK  
ii) GMSK Transmitter & Receiver  
b) If a baseband binary message with bitrate  $R = 100$  kbps is modulated by RF carrier using BPSK, find the range of values required for the rms delay spread of channel such that the received signal is flat-fading signal 6
7. a) Explain with block diagram adaptive equalizer and derive the expression showing equalizer is actually an inverse filter of channel. 7  
b) Explain. 6  
i) Frequency Diversity  
ii) Time Diversity

**OR**

8. a) Write short note on fundamental of channel coding. 6  
b) Explain different space diversity reception methods. 7
9. a) Write features of 6  
i) FDMA  
ii) TDMA  
b) What is spread spectrum multiple access? Explain FHMA. 7

**OR**

10. a) What is duplexing? Explain FDD & TDD with suitable example for each. 6  
b) Write short note of. 4  
i) CDMA  
ii) SDMA 3
11. a) What are different traffic channel and control channel in GSM Explain in detail. 10  
b) Write short note on 4  
CDMA Digital cellular standard.

**OR**

- 12 a) Explain with neat block diagram various different interface that are used in GSM 6  
architecture.  
b) Explain GSM mobile with following. 8  
i) GSM services  
ii) GSM architecture.

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