B.E.(with Credits)-Regular-Semester 2012-Electronics Engineering Sem VII

EN - Digital and Wireless Communication

P. Pages : 2 **GUG/W/16/6593**

Time : Three Hours * 4 6 7 6 * Max. Marks : 80

Notes : 1. All questions carry as indicated marks.
2. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What is frequency reuse concept? Explain it's importance while designing the cellular mobile system. **8**

b) Explain the following terms in details : **8**
i) Public Switched Telephone Network (PSTN)
ii) Mobile Switching Centre (MSC)
iii) Base STATION (BS)
iv) IS-95 2G Standard.

OR

2. a) Enumerate and explain in detail techniques used for improvement of coverage and capacity in cellular system. **8**

b) Given a cellular system with 416 radio channels available for handling traffic. Assume than 21 of these channels are designated as control channels. **8**
Let the average channel holding time of a call be 3 minutes, the blocking probability during busy hours be 2 % and frequency reuse factor be 8.

i) Determine the no. of calls per cell per hours.

ii) Determine the signal-to -co-channel interference ratio.

3. a) Draw the block diagram of QPSK transmitter and receiver and explain their working. **8**

b) Explain the salient features of Quadrature Amplitude Modulation (QAM) scheme. **5**

c) Draw the constellation diagram of an 16-QAM system. **3**

OR

4. a) Explain with neat block diagram transmission and reception of GMSK. **8**

b) Explain the principle of BPSK and DPSK. **8**

5. a) Define inter symbol interference (ISI). How does the equalization compensate for intersymbol interference? Explain with suitable block diagram and mathematical expressions. **8**

b) Explain the various space diversity techniques with their merits and de-merits. **8**

OR

6. Write a short notes on the following. **16**

i) Polarization diversity.

ii) Frequency diversity.

iii) Time diversity.

iv) Fundamentals of channel coding.

7. a) What is duplexing? Give the comparison between Frequency Division Duplexing (FDD) and Time Division Duplexing (TDD). **6**

b) Write a short note on CDMA digital cellular standard. **6**

c) Distinguish between FDMA & TDMA. **4**

OR

8. a) Why spread spectrum multiple access is more efficient for wireless system? Explain the following with suitable example. **10**

i) FHMA

ii) CDMA

iii) SDMA

b) If GSM uses a frame structure where each frame consists of eight time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, Find a) the time duration of a bit, b) the time duration of a slot, c) the time duration of a frame, and d) how long must a user occupying a single time slot wait between two successive transmissions? **6**

9. a) Explain the functions of each block in GSM system Architecture. **8**

b) Give the structure of GSM slot, frame, multiframe, superframe & hyperframe. **8**

OR

10. a) Draw and explain the various GSM signal processing operations from transmitter to receiver. **8**

b) Explain in details GSM control channels. **8**

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