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53 (EC 615) MBCM

2021

**MOBILE COMMUNICATION**

Paper : EC 615

Full Marks : 100

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

*Answer any five questions.*

1. (a) Name the first cellular standard in North America and Europe. State the following features for both the standards : 1+4×2
  - (i) Frequency band
  - (ii) Modulation scheme
  - (iii) Channel bandwidth
  - (iv) Duplexing and multiple access mechanism.
- (b) State channel allocation policy in AMPS cellular system for two service provider scheme. 11

Contd.

2. (a) Define co-channel interference. Why is it not desired? What are the ways you can reduce co-channel interference?

2+2+4

(b) Estimate co-channel interference for a 7 cell cellular system. Show that, in worst case scenario, signal to co-channel interference ratio is 17.35 dB.

12

3. (a) Draw the block diagram of GSM architecture. State the function of the following blocks:

(i) Base station (ii) MSC (iii) GMSC  
(iv) VLR.

5+10

(b) A cellular system uses GSM frequency band 910-1085 MHz. The cellular system uses 7 cells and 21 sectors and equal channel allocation. Discuss how many channels are allocated to each sector.

5

4. (a) Derive power relation between transmitted power and received power in flat and open area.

12

(b) What are the advantages of cell splitting? Explain briefly how it is done in a practical scenario.

8

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5. (a) State, why GMSK is widely used in mobile communication. Explain with block diagram, the working principle of GMSK. What is the benefit of Gaussian filter employed in GMSK over MSK. 2+5+8
- (b) Define fading and differentiate between fast fading and slow fading. 5
6. (a) When will you prefer to use an equalizer over a diversity receiver? How is an equalizer different from an ordinary filter? 2+3
- (b) Discuss LMS approach of weight estimation of a linear equalizer. 15
7. Write short notes on : **(any two)** 10×2
- (i) Hand off
  - (ii) GPRS
  - (iii) Selection combining in Diversity receiver
  - (iv) RAKE receiver
  - (v) CDMA.

