17657

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any <u>THREE</u> of the following:**   **12**

(i) State the significance of frequency reuse in cellular system. Write procedure to select cell for frequency reuse.

(ii) List out specifications of 2.5 G GSM (any four features)

(iii) Compare IS 95 with IS 136 with respect to any four technical specifications.

(iv) Write call processing in cellular telephone system.

Marks

b) **Attempt any <u>ONE</u> of the following:**   **6**

    (i)   State frequency band, channel bandwidth, access netnod and type of modulation used in GSM. Sketch GSM TDM Structure.

    (ii)   How paging system differs from cellular phone system? Compare w.r.t. capacity, operation, applications and system requirement.

2.   **Attempt any <u>FOUR</u> of the following:**   **16**

a) Define the term co-channel. State cause and effect of co-channel interference on system capacity.

b) State any four features of UMTS.

c) LMDS is suitable for local exchange carrier application. Justify and sketch its network diagram.

d) For EDGE 2.5 G and GPRS standard state following specification (2.5 G GSM)

    (i)   DATA RATE

    (ii)   Channel Bandwidth

    (iii) Modulation Technique

    (iv) Number of Voice channels

e) Define the term blockage, call drops, word error rate and voice quality.

f) Calculate system capacity if cluster size is 7 and per cell number of channels are 72. Calculate total system capacity if 14 such clusters are available.

Marks

3. **Attempt any FOUR of the following:** 16

   a) Draw block diagram of cellular transmitter and write the function of each block.

   b) State functions of following blocks of GSM and using sketch show their interconnections.

      (i)   HLR

      (ii) VLR

      (iii) AVC

      (iv) MSC

      (v)   BSC

   c) State capacity improvement methods for cellular system and their limitations. (Any two methods.)

   d) State any four specifications of 3 G CDMA - 2000.

   e) State services offered by SS7 system (any four).

4. a) **Attempt any THREE of the following:** 12

      (i) State any four features of IMT 2000.

      (ii) State specifications for following parameter of GSM air interface

           1) forward channel frequency,

           2) frequency spacing,

           3) no. of user per frame

           4) modulation technique

(iii) State features of IS - 136 and IS - 95B (any four)

(iv) Define the term adjacent channel interference. State methods to reduce it.

b) **Attempt any <u>ONE</u> of the following:**   **6**

(i) State the role of Hand off mechanism in cellular system. Compare hard handoff and soft hand off operational procedure. Define the term Delayed Handoff and Queved hand off.

(ii) State characteristics of SS7. List out its features. State the meaning of signaling point, signal transfer point and signaling links for SS7.

5.   **Attempt any <u>FOUR</u> of the following:**   **16**

a) Draw block diagram of mobile unit and state functions of each block.

b) With block diagram write operation of paging system.

c) List out any four features of IS - 95 CDMA system.

d) Sketch architecture of WLL system and list its advantages. (Any two)

e) Write the concept of Ad-voc mobile communication for 4 G.

f) Define forward voice channel, reverse voice channel, micro cell, repeater.

Marks

6.   **Attempt any FOUR of the following:**   **16**

   a) State working principle of receiver of mobile unit. State significance of RSSI signal.

   b) For IS - 95, List out channels specification, state information available on forward traffic channel.

   c) State any four features of Bluetooth and PAN.

   d) For mobile unit, how many signals are obtained from frequency synthesizer? State the use of these signals. Why their frequency shall be different?

   e) For IS - 95 write the meaning and their sequence of following: call processing state, system access state, system idle state, traffic channel state, system initialisation state.

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