

# 17657

**15162**

**3 Hours / 100 Marks**

Seat No.

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

**Marks**

1. a) Attempt any THREE of the following: 12
- (i) Describe the concept of frequency reuse used in cellular systems. Define clusture. Draw frequency reuse pattern for clusture size 7.
  - (ii) List following specifications of IS-95B 2.5 Generation Standard.
    - 1) Channel Bandwidth
    - 2) No. of Voice Channels.
    - 3) Duplexing Tech.
    - 4) Data Rate.
  - (iii) State various 2.5 generations cellular standards based on TDMA and CDMA. State whether they are backward compatible with second generation (2G) standard.
  - (iv) Illustrate the operation of Radio paging system and state its main drawback.

P.T.O.

b) **Attempt any ONE of the following:****6**

- (i) Draw GSM logical channel structure. Describe in detail GSM traffic channels.
- (ii) Illustrate with the help of neat timing diagram, the process of call initiation from mobile handset to a landline phone (PSTN) using timing diagram.

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

- a) Describe adjacent channel interference in cellular system, with the help of appropriate diagram. How it can be minimized?
- b) List the following parameters of 3G-TD-SCDMA system. (any four).
  - (i) Bandwidth
  - (ii) Data Rate
  - (iii) Multiple Access
  - (iv) Backward Compatibility
  - (v) Developed by
- c) State any four features of Third Generation (3G) standard systems and list various 3G standards.
- d) Compare GPRS standard with IS-95-B stand w.r.t.
  - (i) Backward Compatibility
  - (ii) Channel Bandwidth
  - (iii) Data Rate
  - (iv) Number of voice channels.
- e) State any four specifications of Personal Area Network (PAN).
- f) Illustrate with the help of neat figure proper and improper hand-off procedure.

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

- a) Define the following terms with respect to cellular system.
  - (i) Mobile station
  - (ii) Base station
  - (iii) Forward channel
  - (iv) Control channel
- b) Explain authentication process in GSM system with the help of appropriate sketch.
- c) State four ways to improve capacity and coverage in cellular system. Describe how repeaters are used for range extension.
- d) State any four specifications of UMTS.
- e) State the concept of signalling system No.7 (SS7). Draw architecture of SS7 for NSP of the protocol. (Only lower three layers of OSI model).

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

- (i) State the significance of IMT-2000. State vision of IMT-2000. (four points).
- (ii) Draw GSM system architecture and explain function of HLR and OMC units.
- (iii) List the following specifications of IS-136 standard.
  - 1) Frequency Spectrum
  - 2) Channel Bandwidth
  - 3) Data Rate
  - 4) Modulation Technique
- (iv) Describe cell splitting technique with the help of neat sketch. How it increases system capacity?

b) Attempt any ONE of the following:

6

- (i) Draw basic cellular system. State advantages of cellular system and define :
  - 1) frequency reuse and
  - 2) frequency reuse ratio
- (ii) State and explain the three services offered by GSM system.

5. Attempt any FOUR of the following:

16

- a) Identify the given block diagram and name the blocks. A, B, and C. State the function of Identified block diagram. (Refer Figure No.1)

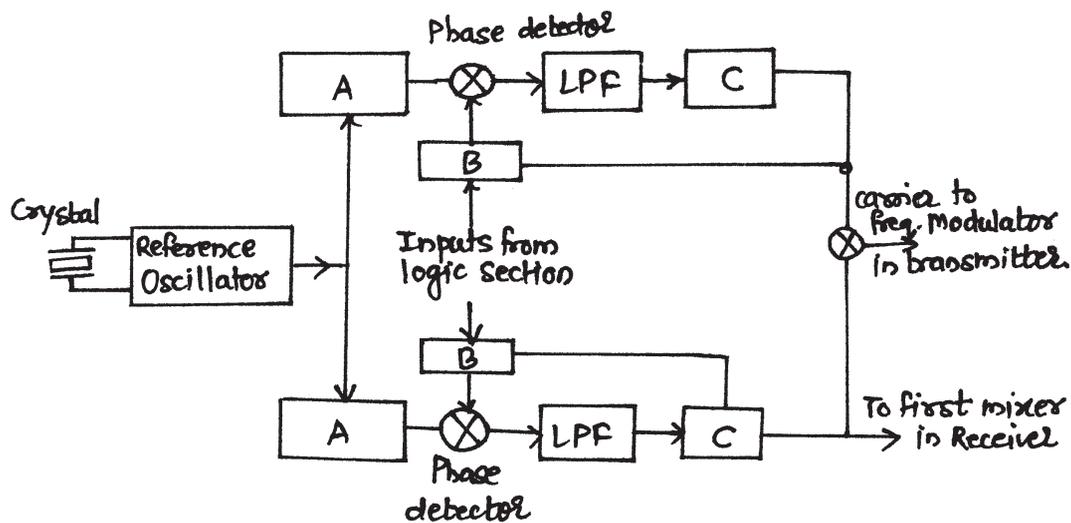


Fig. No. 1

- b) Compare IS-95 system with GSM system with respect to following points. (any four points)
  - (i) frequency spectrum
  - (ii) multiple access
  - (iii) channel bandwidth
  - (iv) SMS length
  - (v) type of hand-off.

- c) Draw architecture of IS-95 system and State function of any two blocks.
- d) Draw neat figure of wireless local loop and state its importance.
- e) State the concept of following terms.
  - (i) Voice channel blockage
  - (ii) Call drops
  - (iii) Voice quality
  - (iv) Ward error rate
- f) Define the following terms
  - (i) MSC
  - (ii) Co-Channel interference
  - (iii) System capacity
  - (iv) Frequency Reuse distance

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

**16**

- a) Draw block diagram of mobile unit and state function of each block. State two features of mobile handset.
- b) Describe Radio aspect and Security aspects of IS-95 system.
- c) Illustrate operation of wireless LAN in Ad-hoc mode with neat sketch and labelled diagram.

- d) Identify the given block diagram and state function of blocks A, B, and C. (Refer Figure No.2)

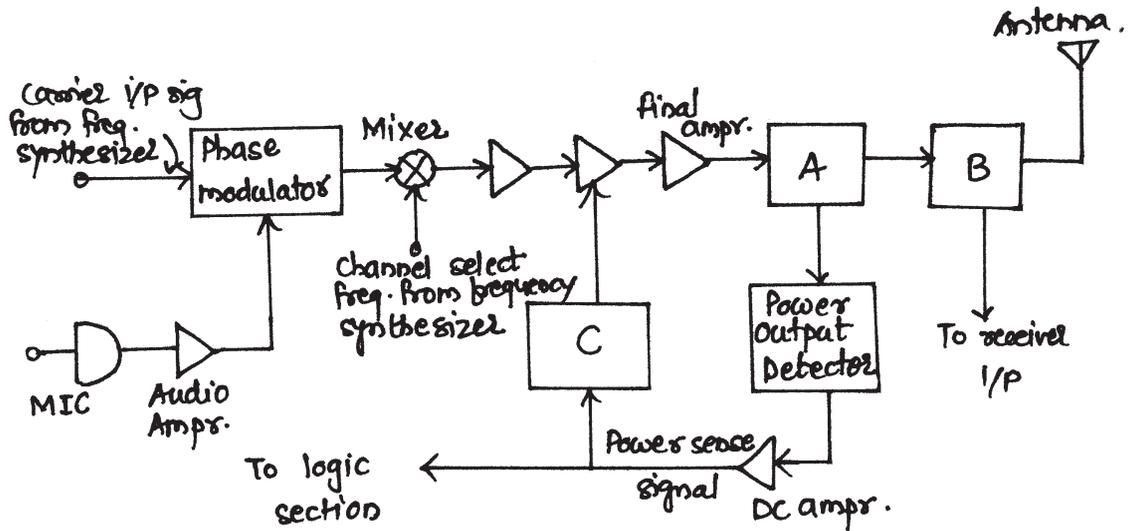


Fig. No. 2

- e) State any four features of IS-95 standard and describe them.