

17657

16117

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) Use of Non-programmable Electronic Pocket Calculator is permissible.
(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) Draw block diagram of basic cellular system. State advantages of cellular system.
- (ii) List the following specifications of EDGE 2.5G standard.
- (1) Backward compatibility
 - (2) Channel bandwidth
 - (3) Data rate
 - (4) Duplexing method
- (iii) Compare IS-95B standard with GPRS with respect to following points.
- (1) Backward compatibility
 - (2) Channel bandwidth
 - (3) Duplexing tech
 - (4) No. of voice channels.

P.T.O.

(iv) Illustrate operation of cordless telephone system with the help of neat sketch.

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

(i) Describe various stages of call processing in GSM system with the help of neat diagram.

(ii) Illustrate the process of call initiation from landline telephone to cellular phone with neat timing diagram.

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

a) Describe the effect of co-channel interference in cellular systems. How it affects system capacity ?

b) State any four specifications of UMTS.

c) Name the systems A and B which supports following features.

	Parameter	A		Parameter	B
1)	Frequency Band	2400-2483.5 MHz	1)	Packet data rate	384 kbps
2)	Duplexing method with frequency hopping	TDD	2)	Duplexing method	TDD
3)	Channel BW	-1 MHz	3)	Channel BW	1.6 MHz
4)	Modulation Tech	GFSK	4)	Antenna used	smart antenna

d) List four specifications of GPRS 2.5G GSM standard.

e) State four features of Bluetooth.

f) Describe how “umbrella cell approach” is used in cellular system to reduce the number of hand-offs ?

- 3. Attempt any FOUR of the following:** **16**
- a) Draw block diagram of frequency synthesizer unit of mobile handset and state its function in cellular handset.
 - b) Draw GSM architecture and explain function of HLR and VLR.
 - c) State the different techniques used to improve capacity and coverage in cellular system. Describe cell sectoring technique in detail.
 - d) List any four features of third generation (3G) cellular standard state various 3G standards. (TDMA and CDMA based).
 - e) State and explain the various performance services offered by SS7 protocol.
- 4. a) Attempt any THREE of the following:** **12**
- (i) State the radio spectrum for IMT-2000. State vision of FMT-2000 (Four points)
 - (ii) State the various services offered by GSM standard. Describe these services in detail.
 - (iii) Compare GPRS with IS-136. (Any four points)
 - (iv) Define the term adjacent channel interference. State methods to reduce it?
- b) Attempt any ONE of the following:** **6**
- (i) Describe the concept of 'frequency reuse' used in cellular systems. Also calculate the capacity for clusture size of 7 in cellular system which has 504 radio channels available for handling traffic. Calculate number of channels per cell. If number of clusters available in cellular systems are 15, then calculate capacity of system.
 - (ii) Draw SS7 protocol architecture and state the function of NSP of SS7.

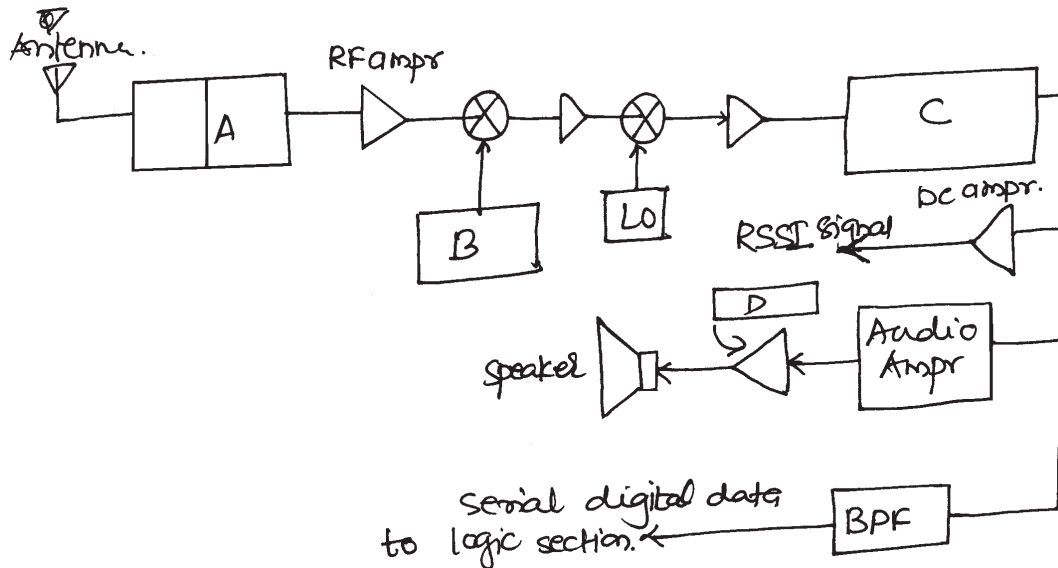
5. Attempt any FOUR of the following:**16**

- a) Draw neat block diagram of transmitter unit of mobile handset. State function of APC loop and duplexer unit in unit.
- b) Compare GSM standard with N-Amps standard with respect to following point.
 - (i) Generation
 - (ii) Channel bandwidth
 - (iii) Whether analog or digital
 - (iv) Data rate
 - (v) Frequency Band. (Any four points)
- c) Draw the forward channel structure of IS-95. Write function of each channel in it.
- d) Draw neat block diagram of wireless local loop (WLL) network and state its importance.
- e) State importance of the following terms:-
 - (i) Blockage
 - (ii) Voice call blockage
 - (iii) Voice quality
 - (iv) Word error rate
- f) Define the following terms.
 - (i) Control channels
 - (ii) Mobile station
 - (iii) MSC
 - (iv) Cell splitting.

6. Attempt any FOUR of the following:

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- a) Complete and identify the given block diagram and state function of block A and RSSI signal.



- b) Compare IS-95 standard with GSM system with respect to following points.
- Channel Bandwidth
 - Type of modulation
 - SMS length
 - Number of voice channels.
- c) Draw 4G wireless architecture and state any four features of 4G standard.
- d) Draw block diagram of mobile unit and state function of each block. Also state two features of mobile hand set.
- e) List out any four key features of IS-95 CDMA system.