

17657

11718

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--	--

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

- (a) What is frequency planning in cellular system ? Draw frequency reuse pattern for $N = 4$ and $N = 7$.
- (b) List out features of HSC5D for 2.5 G GSM system.
- (c) For EDGE 2.5 G and GPRS, state following specifications :
 - (i) data rate
 - (ii) channel bandwidth
 - (iii) modulation technique
 - (iv) number of voice channels.
- (d) Write a short note on the evolution of radio mobile communications.

[1 of 4]

P.T.O.

- (B) Attempt any ONE of the following :** **6**
- (a) Describe call making procedure from mobile handset to a landline phone (PSTN) with neat timing diagram.
 - (b) Describe working principle of paging system with neat block diagram. Compare paging system with cellular phone system.
- 2. Attempt any FOUR of the following :** **16**
- (a) State four ways to improve capacity and coverage in cellular system. How repeater are used for range extension.
 - (b) Describe wireless local loop (WLL) with neat diagram.
 - (c) Define blockage, call drops, word error rate and voice quality.
 - (d) State features of IS 95 B and IS-136.
 - (e) State any four features of MANET.
 - (f) Draw basic cellular system and define :
 - (i) Frequency reuse and
 - (ii) Frequency reuse ratio
- 3. Attempt any FOUR of the following :** **16**
- (a) Describe working of frequency synthesizer used in mobile handset.
 - (b) Draw GSM system architecture and explain function of HLR and OMC units.
 - (c) A mobile communication system is allocated RF spectrum of 25 MHz with RF channel bandwidth of 25 kHz and if service area is divided into 20 cells with cluster size of 4, compute system capacity.
 - (d) State any four specifications of UMTS.
 - (e) State the concept of signalling system No. 7 (SS7). Draw SS7 protocol model (only lower three layers of OSI model).

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

- (a) List any four vision of IMT-2000.
- (b) List and describe different types of Traffic Channels (TCHS) provided in GSM.
- (c) Compare GPRS standard with IS-95 B standard w.r.t.
 - (i) Backward compatibility
 - (ii) Channel bandwidth
 - (iii) Data rate
 - (iv) Number of voice channels
- (d) With the help of neat sketch, explain the microcell zone concept.

(B) Attempt any ONE of the following :**6**

- (a) Explain concept of cell splitting with neat diagram. Show that if cell radius is reduced by factor of $\frac{1}{2}$ then traffic load increases by factor of 4. Assume shape of cell is circular.
- (b) State and explain the various SS7 services.

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

- (a) Draw the block diagram of receiver unit of mobile handset and state it's function.
- (b) State examples of wireless communication system and explain cordless telephone system with block diagram.
- (c) Draw architecture of IS-95 system and state function of any two blocks.
- (d) Compare 3G W-CDMA (UMTS) and 3G CDMA 2000.

P.T.O.

- (e) State features of Bluetooth and PAN (Personal Area Network).
- (f) Define hand off. Explain basic process of handoff with neat diagram. List types of hand off.

6. Attempt any FOUR of the following :

16

- (a) Draw block diagram of mobile unit and state function of each block.
 - (b) List any four features of IS-95 CDMA.
 - (c) Write the concept of Ad-hoc mobile communication for 4G.
 - (d) Draw the block diagram of logic unit and write function of each block.
 - (e) Describe radio aspect and security aspects of IS-95 system.
-