17657

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

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

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

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

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

Marks

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

(i) Define

(1) Mobile switching center

(2) Base station

(3) Dwell time

(4) Hand off

(ii) Describe working principle of paging system with neat block diagram.

(iii) State advantages of sectoring in cellular system (4 points)

(iv) Draw block diagram of logic unit of mobile handset and explain its working.

Marks

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

(i) Explain any three mobile radio systems around the world in brief.

(ii) Describe call making procedure from mobile handset to landline phone with neat timing diagram.

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

a) Compare CT2 and DECT with respect to range of frequency, and modulation type.

b) Describe microcell zone with suitable diagram.

c) Explain two level hand off with suitable diagram.

d) Describe concept of cluster. Explain effect of cluster size on system capacity and co-channel interference.

e) Describe working of frequency synthesizer used in mobile handset.

f) A mobile communication system is allocated RF spectrum of 25 MHz with RF channel B.W. of 25 KHz and if service area is divided into 20 cells with cluster size of 4. Compute system capacity.

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

a) With neat sketch of proper and improper situation of hand off explain when should hand off take place and justify what will happen if hand off not done at proper signal level.

b) Describe operation of LMDS with suitable diagram.

c) State function of VLR, HLR, AUC and OMC in GSM system.

d) Define co-channel cells. Determine distance from nearest co-channel cell having radius 0.64 km and co-channel reuse factor of 12.

e) List four features of HSCSD for 2.5 GSM system.

f) State signaling traffic load in SS7 for:

(i) Call origination from mobile

(ii) Inter MSC hand off.

Marks

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

(i) List any four features of IS-95 CDMA.

(ii) Describe call processing in IS-95.

(iii) Explain authentication process in GSM with suitable diagram.

(iv) Describe process of mobile terminated call in GSM with neat call flow sequence diagram.

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

(i) 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 as circular.

(ii) State GSM control channels. Give functions of each channel.

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

a) Draw block diagram of forward CDMA channel modulation process.

b) Describe any four SS7 services.

c) Draw architecture of 4G wireless system.

d) Draw architecture diagram of GPRS network.

e) State any four features of bluetooth.

f) Draw SS7 protocol architecture. Write any two features of SS7.

Marks

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

a) List any four features of MANET.

b) State any four characteristics of adhoc networks.

c) Explain EDGE system for 2.5 GSM.

d) Compare 3G WCDMA (UMTS) and 3G CDMA 2000 with respect to carrier spacing, chip rate, power control frequency and coding.

e) List any four visions of IMT 2000.

f) State any four advantages of 3G wireless network system.
