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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) 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)   Define the following terms:

1)   Base station subsystem

2)   Handoff

3)   Mobile switching centre

4)   Forward control channel

(ii) Draw well labelled simplified eye pattern of optical fiber and define noise margin and timing jitter related to it.

(iii) Draw block diagram of optical communication system and describe its working.

(iv) With respect to the following points, justify how fiber optical communication system is better than copper wire communication system:

1)   Interference resistance

2)   Bandwidth

3)   Picture quality

4)   Efficiency

Marks

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

      (i)   Omni Telecom Company managers used pager device to communicate with their service engineers on site. State and explain the procedure with diagram for routing message from manager's end to service engineer's pager device.

      (ii)   Define the following terms and draw diagram for same:

         1)   Acceptance cone

         2)   Critical angle

         3)   Reflection

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

   a)   Suman called from her mobile on landline number (020) (25221740) to enquire about mobile repairing course. In this case explain how call processing takes place on control and voice channels with respect to timing diagram.

   b)   Name the device used for fault finding in fiber optic cable. Explain its working principle with neat diagram.

   c)   State any four different losses in fiber optic communication system. Explain four cases where and how coupling losses can occur with neat diagram.

   d)   State any three techniques which can be used for improving coverage and capacity in cellular system. Explain any one with neat diagram.

   e)   Explain any two quality parameters with respect to:

      (i)   Optical source

      (ii)   Optic detector

Marks

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

a) Draw neat diagram of frequency synthesizer used in mobile handset and explain its working.

b) Define frequency reuse. Draw frequency reuse pattern with three clusters each having seven cells. Why frequency should be revised in cellular communication technology?

c) Describe the working PIN and Avalanche photo diode with diagram.

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

(i) What is optical joints? Explain how prefusion splicing is done in optical fiber.

(ii) Define co-channel interference. Explain how co-channel interference can be reduced.

(iii) Compare GSM system and IS-95 CDMA system with respect to:

1) handoff

2) data rate

3) channel bandwidth

4) access method

(iv) Draw schematic of LASER and describe its working principle with state transaction process involved in LASER process.

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

(i) State any six radio parameters of GSM system with their specification.

(ii) Explain any six features of IMT-2000 vision.

Marks

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

a) State the meaning and significance of "S" 3G - TD - SCDMA. List any four features of 3G - TD - SCDMA.

b) With help of neat diagram, explain procedure involved and logic used while making of handoff.

c) Draw and explain architecture of local multipoint distribution service.

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

a) State classification of optical fiber with respect to index profile (only diagram is expected) and which configuration os optical fiber (SMSI, MMSI, MMGI) suffers with maximum pulse dispersion. Justify your answer with help of diagram only.

b) Draw well labelled diagram of IS-95 architecture and state function of any two blocks.

c) State the function of following in GPRS network:

(i) Serving GPRS support node (SGSN)

(ii) Gateway GPRS support node (GGSN)

d) State the specific value for the given radio parameters of IS-95:

(i) Reverse link frequency

(ii) Maximum user data rate

(iii) Forward link frequency

(iv) Chip rate

Marks

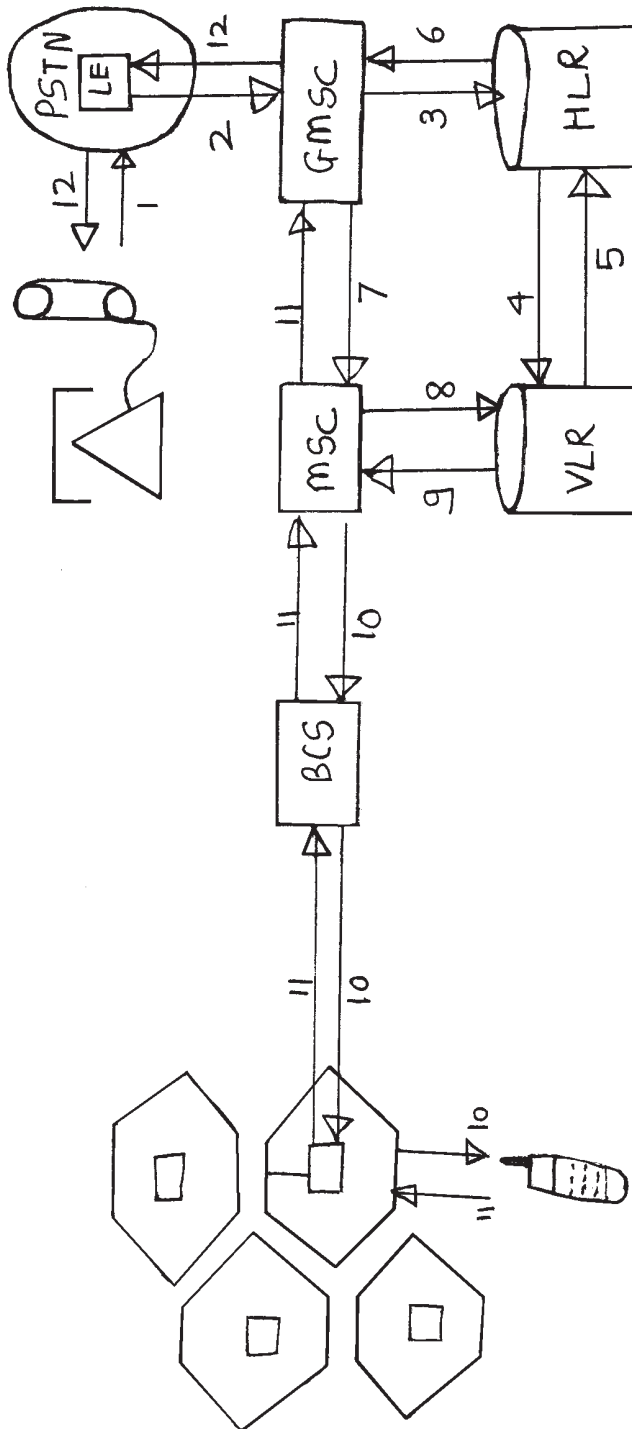e) Identify the given diagram and explain its call flow sequence.

Fig. No. 1