

17438

14115

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) Assume suitable data, if necessary.
- (6) Use of Non-Programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any SIX from the following :

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- (a) Define Noise factor & Noise figure.
- (b) List any four applications of satellite.
- (c) State the main function of session layer and transport layer.
- (d) List any four types of digital modulation techniques.
- (e) What is TDM ? Where it is used ?
- (f) What is the necessity of using hexagonal shape cell for mobile communication ?
- (g) What is Biphase concept ? List its two types.
- (h) What is LEO ? State its frequency range.



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(B) Attempt any TWO from following :**8**

- (a) State the bandwidth requirements for FSK, BPSK, QPSK & DPSK.
- (b) Write step by step procedure for wire line (PSTN) to mobile (Cellular) call procedure.
- (c) What is network topology ? Describe Mesh topology.

2. Attempt any FOUR from following :**16**

- (a) Draw & explain block diagram of communication system.
- (b) Draw and explain natural sampling and Flat-top sampling.
- (c) State the different levels used in the bipolar coding. Draw & explain AMI in detail.
- (d) With neat sketch, explain working principle of DPSK.
- (e) Define modulation index for FM. Calculate the modulation if the frequency deviation of carrier is ± 25 kHz and maximum modulating frequency is 10 kHz.
- (f) Compare PAM & PPM on the basis of the (i) Transmitted power (ii) Bandwidth requirement (iii) Output waveforms (iv) Noise immunity.

3. Attempt any FOUR from following :**16**

- (a) State and explain sampling theorem.
- (b) Draw & explain FM modulation circuit using varactor diode.
- (c) What is cell ? What are its types ? State the major drawback of cell splitting.
- (d) What is FSK ? State its principle. Draw the diagram to generate FSK.
- (e) Draw electromagnetic frequency spectrum range & write its description.
- (f) Explain any two advantages & disadvantages to telemedicine.

4. Attempt any FOUR from following :**16**

- (a) What is hand off ? List four basic steps involved in hand off process.
- (b) What is co-channel & adjacent channel interference ?
- (c) State one application for repeater, bridge, router & gateway.
- (d) Explain the term digital signature & message integrity related to network security.
- (e) State the basic Concept for the following :
 - (i) Tele psychiatry
 - (ii) Tele dermatology
- (f) Draw basic block diagram of single channel biotelemetry system for ECG & explain each block.

5. Attempt any FOUR from following :**16**

- (a) Compare star & bus topology on the basis of (i) arrangement of nodes (ii) standard used (iii) unit used for data transmission (iv) Ease of installation & maintenance.
- (b) What are the different types of data transmission ? Compare serial and parallel communication.
- (c) Draw the architecture of OSI model & explain the use of physical & data link layer.
- (d) With a schematic diagram define angle of elevation & azimuth angle.
- (e) Compare LAN & WAN with respect to following points :
 - (i) Speed
 - (ii) Area coverage
 - (iii) Basic Structure diagram
 - (iv) Application
- (f) What is teleradiology ? Describe briefly its operation with block diagram.

6. Attempt any FOUR from following :**16**

- (a) What is FDM ? List advantages & disadvantages.
 - (b) What is delta modulation ? What is its limitations ? How it is overcome ?
 - (c) With a basic block diagram explain the principle of operation of PCM.
 - (d) Draw the schematic diagram for satellite orbital pattern & describe Apogee, Perigee, major axis & minor axis.
 - (e) Draw basic block diagram for communication satellite.
 - (f) What is transponder used in satellite ? Describe the block diagram for satellite transponder in detail.
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