Time: - 2½ Hours   Total Marks: 60

N.B. (1) Figures to the right indicate full marks.
      (2) All questions are compulsory.
      (3) Use of non-programmable calculator is allowed.
      (4) Symbols have their usual meaning unless stated otherwise.

Q.1 a) Attempt any **one**

i) Explain the relationship between bits per second and baud for a QPSK system and give the significance of the I and Q channels in a QPSK modulator. **8**

ii) Explain the relationship between the minimum bandwidth required for an 8-PSK system and the bit rate. **8**

Q.1 b) Attempt any **one**

i) Determine the Nyquist sample rate for a maximum analog input frequency of 10 kHz. **4**

ii) What is the difference between standard FSK and MSK? What is the advantage of MSK? **4**

Q.2 a) Attempt any **one**

i) Describe the basic operation of a cordless telephone. **8**

ii) Describe automated central office switches and exchanges and their advantages over operator-assisted local exchanges. **8**

Q.2 b) Attempt any **one**

i) List the advantages and disadvantages of WDM. **4**

ii) What limitations are imposed with D-type conditioning? **4**

Q.3 a) Attempt any **one**

i) With help of neat and labelled diagram explain the concept of simplified cellular telephone system topology. **8**

ii) Describe briefly GSM services and GSM system architecture. **8**

Q.3 b) Attempt any **one**

i) Explain the term frequency reuse Determine the number of channels per cluster and the total channel capacity for a cellular telephone area comprised of 10 clusters with seven cells in each cluster and 10 channels in each cell. **4**

ii) Explain the concept of event driven programming and polling used in serial communication system. **4**

Q.4 a) Attempt any **one**

i) Write a python program to find the sum of natural numbers up to n where n is provided by user. Explain each step in detail and provide with a sample output for the above program. **8**

ii) Write a python program to find Fibonacci sequence for a given interval given by the user. Explain the each working of the **8**

Turn Over

program and give an example for the same.

Q.4 b) Attempt any **one**

i) Explain the use of 'if' statement in python programming language **4**

ii) Explain the concept of global variable and local variable used in python program. **4**

Q.5 Attempt any **four**

i) What is the purpose of a clock recovery circuit? When is it used? **3**

ii) Explain quantizing. What is quantization range? Quantization error? **3**

iii) What is meant by the term loop resistance? **3**

iv) Define call progress tones and signals. **3**

v) Explain what is meant by channel density

vi) Explain the term TDMA and CDMA. **3**

vii) What do you mean by operator precedence? Explain with help of examples. **3**

viii) Explain the use of following operator '&','|'.'%'. **3**