(2 ½ Hours)   **[Total Marks: 60**

N.B: (1)   **<u>All questions are compulsory.</u>**
        (2)   Figures to the **right** indicate full marks.
        (3)   **Assume additional data if necessary** but state the same clearly.
        (4)   Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
        (5)   Use of **calculators** and statistical tables are **allowed**.

Q.1   Attempt **<u>any two</u>** of the following   **(12)**
  a)   Explain the implementation of Computer Voice Response system.   **6**
  b)   State and explain various applications of digital signal processing.   **6**
  c)   List and explain use of major logic families in digital signal processing applications.   **6**
  d)   Write a note on Special purpose hardware for digital filtering and signal generation.   **6**

Q.2   Attempt **<u>any two</u>** of the following   **(12)**
  a)   Write note on causality and seperability.   **6**
  b)   What is fast scratch memory? Explain.   **6**
  c)   Write a note on direct form FIR hardware.   **6**
  d)   Write a note on Digital Frequency Synthesizer.   **6**

Q.3   Attempt **<u>any two</u>** of the following   **(12)**
  a)   Briefly explain the bit reversal and digit reversal for fixed radices.   **6**
  b)   Explain the Hardware for Radix 2 Algorithm.   **6**
  c)   Write a note on Radix 4 Parallel structures using RAM's.   **6**
  d)   Briefly describe the real time convolution via FFT using a single Ram.   **6**

Q.4   Attempt **<u>any two</u>** of the following   **(12)**
  a)   Write a note on parallel operations of memories.   **6**
  b)   Write a note on input output problems for real time processing of digital signals.   **6**
  c)   Briefly explain the digital models of speech production.   **6**
  d)   Briefly describe the homomorphic processing of speech signals.   **6**

Q.5   Attempt **<u>any two</u>** of the following   **(12)**
  a)   Write a note on parameter- Signal design and ambiguity functions.   **6**
  b)   Write a note on Airborne Surveillance Radar for Air Traffic Control.   **6**
  c)   Explain the working principle behind vocoder-formant Synthesis.   **6**
  d)   Write a note on Linco Laboratory Fast Digital Processor.   **6**

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