Duration Three Hours   **Total Marks 80**

N.B.   [i]   Question No 1 is compulsory and attempts any three out of remaining five
            questions.
     [ii]   Assume suitable data wherever required.
     [iii]   Figures to the right indicate full marks.

1.   **Solve any four**

  (a) Distinguish between Von Neumann and Harvard architectures, supported by a   5
      diagram.

  (b) Elaborate on the significance of each bit in the PSW register of the 8051   5
      microcontroller.

  (c) Describe the functionality of the following ARM7 instructions.   5
        ➢ ADD R0,R2,R3,LSL#1
        ➢ CMP R0,R1,LSR#7

  (d) Illustrate the application of the PIC16F886 microcontroller in the speed control of a   5
      DC motor.

  (e) Explain the concept of virtual memory management.   5

2. (a) Classify various Memories and explain the types of Semiconductor memories.   10

  (b) What factors need to be considered when selecting a microcontroller for a specific   10
      application?

3. (a) Explain in detail with diagrams timers of 8051 microcontroller.   10

  (b) Explain Interrupt structure of 8051 microcontroller.   10

4 (a) Explain various addressing modes of the 8051 with two examples each.   10

  (b) Describe the features of the ARM 7 architecture, and discuss its pipeline structure.   10

5. (a) Develop an assembly language program for the 8051 microcontroller to receive bytes   10
      of data serially at a baud rate of 4800 and transmit them to port P1. The data format
      is 8 bits with one stop bit. Assume the 8051 microcontroller operates at a frequency
      of 11.0592 MHz

  (b) Explain the concept of Cortex A, Cortex R and Cortex M in ARM architecture.   10

6 (a) Compare the RISC and CISC architectures. Determine which architecture the 8051   10
      microcontroller belongs to, and provide reasoning to support your answer.

  (b) What are Assembler Directives, and how do they differ from microcontroller   10
      instructions? Provide explanations and examples of a few assembler directives.

                                 ****

54765