

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

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| (a) Distinguish between Von Neumann and Harvard architectures, supported by a diagram. | 5 |
| (b) Elaborate on the significance of each bit in the PSW register of the 8051 microcontroller. | 5 |
| (c) Describe the functionality of the following ARM7 instructions.
➤ ADD R0,R2,R3,LSL#1
➤ CMP R0,R1,LSR#7 | 5 |
| (d) Illustrate the application of the PIC16F886 microcontroller in the speed control of a DC motor. | 5 |
| (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 application? | 10 |
| 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 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 | 10 |
| (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 microcontroller belongs to, and provide reasoning to support your answer. | 10 |
| (b) What are Assembler Directives, and how do they differ from microcontroller instructions? Provide explanations and examples of a few assembler directives. | 10 |
