

EXTC

SESEM IV C-Scheme May June 2026

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) Elaborate on the significance of each bit in the PSW register of the 8051 microcontroller. 5
 - (b) Distinguish between Von Neumann and Harvard architectures, supported by a diagram. 5
 - (c) Explain TCON register of timer in 8051. 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 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. 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
