

Name: Enrolment No:			
UPES End Semester Examination, December 2025 Course: Automotive Microcontroller Program: B. Tech-Automotive Design Engineering Course Code: MEAD4027P_3 Semester: VII Time: 03 hrs. Max. Marks: 100 Instructions: Assume any data in programming, if required.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	What is a Microcontroller? How is a Microcontroller different from a Microprocessor?	4	CO1
Q 2	List at least four real-time applications of Microcontroller.	4	CO2
Q 3	What is the purpose of Cross-Compilers in Microcontroller Programming?	4	CO2
Q 4	What is the function of Program Counter in Microcontrollers?	4	CO2
Q 5	List and define various components of microcontroller programming.	4	CO1
SECTION B (4Qx10M= 40 Marks)			
Q 6	Draw and explain the block diagram of signal processing unit (SPU) used in microcontrollers.	10	CO1
Q 7	Explain the difference between RISC and CISC architectures in microcontrollers. Briefly discuss Von-Neuman architecture is implemented in microcontrollers.	10	CO3
Q 8	Explain in detail design issues of Serial Communication Interface (SCI) used in microcontrollers & embedded systems.	10	CO3
Q 9	What are the advantages of using interrupts compared to polling in microcontroller systems? OR Differentiate between capture and compare modes in microcontroller timers.	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 10	List and briefly discuss all six microcontroller families. Explain key differences (at least 5) between ARM and AVR Microcontrollers.	20	CO4

Q 11	In detail explain the designing and programming of various embedded systems components like timers, Data acquisition interfaces and drivers. OR What do you mean by pulse width modulation (PWM)? Present an analysis on how pulse width modulation signals are generated. Also, with help an example explain how PWM can be used for stepper motor control applications.	20	CO4
------	---	-----------	------------