Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.
(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., ELECTRONICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
VI	PART - III	CORE	U21EL609	ADVANCED MICROCONTROLLER AND RTOS

Date & Session: 24.04.2025/FN   **Time: 3 hours**   **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	What is the operating voltage of Atmega328? a) 12V to 9V b) 1.8V to 5.5V c) 1.9V to 5V d) 1.1V to 5V
CO1	K2	2.	Write how much flash memory does the Atmega328 have? a) 13K bytes b) 256K bytes c) 32K bytes d) 16K bytes
CO2	K1	3.	Identify the total space for the data memory available in the AVR based microcontroller. a) FFH b) FFFH c) FFFFH d) FFFFFH
CO2	K2	4.	Show the size of general-purpose register file in AVR microcontrollers? a) 16 registers b) 32 registers c) 64 registers d) 128 registers
CO3	K1	5.	What is the main purpose of a system clock in a microcontroller? a) Power management b) Synchronization of operations c) Interrupt handling d) Reset control
CO3	K2	6.	Select which register in microcontroller is typically used to configure the clock source? a) Stack pointer b) Status register c) System Control Register (SCR) d) Clock Control Register (CCR)
CO4	K1	7.	Express the purpose of a tri-state buffer in I/O ports of a microcontroller. a) Amplifying signals b) Preventing simultaneous read and write operations c) Enabling power-saving mode d) Synchronizing data transfer
CO4	K2	8.	Select Pull-up resistors in I/O ports are used to: a) Drive the pin to a high state when not driven b) Increase current flow c) Reduce noise d) Protect the microcontroller
CO5	K1	9.	Which of the following is the key feature of an RTOS? a) High throughput b) Deterministic behaviour c) Dynamic frequency scaling d) Low power consumption
CO5	K2	10.	Show the uses for semaphore in RTOS a) Interrupt handling b) Power management c) Task communication and synchronization d) Memory allocation

Course Outcome	Bloom's K-level	Q. No.	SECTION – B (5 X 5 = 25 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	11a.	Write the Key features of ATmega 328P.
			(OR)
CO1	K3	11b.	Discover the some applications of ATmega328P in embedded systems?
CO2	K3	12a.	Find the types of memory in AVR microcontrollers?
			(OR)
CO2	K3	12b.	Prepare the function of general-purpose registers in AVR.
CO3	K4	13a.	Write short notes on Low frequency crystal oscillator.
			(OR)
CO3	K4	13b.	Illustrate the role of Interrupt Vectors in ATmega 328P.
CO4	K4	14a.	Simplify the function of I/O ports in ATmega328P?
			(OR)
CO4	K4	14b.	Classify the modes of operation of Timer/Counter in ATmega328P?
CO5	K5	15a.	Differentiate between tasks and threads in an RTOS.
			(OR)
CO5	K5	15b.	Predict the role of thread scheduling in an RTOS?

Course Outcome	Bloom's K-level	Q. No.	SECTION – C (5 X 8 = 40 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	16a.	Draw and explain the pinout of ATmega 328P.
			(OR)
CO1	K3	16b.	How does the ATmega 328P execute instructions with suitable example?
CO2	K4	17a.	Discover the role of the Program Counter in AVR microcontrollers?
			(OR)
CO2	K4	17b.	Compare SRAM and EEPROM in AVR microcontrollers.
CO3	K4	18a.	Classify the clock sources available in ATmega328P?
			(OR)
CO3	K4	18b.	Analyse the purpose of Brown-Out Reset (BOR) and Reset pin in ATmega328P?
CO4	K5	19a.	Critically evaluate the function of USART in SPI Mode?
			(OR)
CO4	K5	19b.	Justify how PWM is generated using Timer/Counter in ATmega328P
CO5	K5	20a.	Defend the role and configuration of memory management in FreeRTOS?
			(OR)
CO5	K5	20b.	Evaluate the function of interrupt service routines (ISRs) and tasks in an RTOS.