Enrollment No: _____

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech Mid Semester Exam

Semester: VI **Date: (01/02/2024)**
Subject Code: (203113387) **Time: (1hr: 30min)**
Subject Name: (Advanced Micro computing Systems) **Total Marks: 40**

Sr. No.		Marks
Q.1	(A) Answer the following questions in short.	05

1. How many GPIO pins does the Atmega328 have?
2. What is the clock source for Atmega328?
3. What is the maximum operating frequency of the Atmega328 microcontroller?
4. Which pins are used for PWM output in Atmega328?
5. What does ISP stand for in the context of Arduino programming?

(B) Answer the following questions in short.

1. Name and list the blocks typically found on an Arduino development board aside from the microcontroller 8051. — 02
2. Who is considered the father of Arduino? In which year was, the first Arduino board released? — 02
3. What is the purpose of the "for" loop in Arduino programming? — 01

Q.2 Attempt any four(Short Questions) — 12

(1) Discuss the significance of the multiple power supply pins (VCC, AVCC, AREF) in the Atmega328 microcontroller and their respective voltage requirements.
(2) Describe the power-saving features implemented in the Atmega328 microcontroller and their significance in low-power embedded systems design.
(3) Differentiate between Arduino and Microcontroller.
(4) Draw the general-purpose register layout of Atmega 328P.
(5) Differentiate between parallel and serial communication with advantages and disadvantages of both.

Q.3 Attempt any two questions — 08

(1) Compare the Atmega328 with another member of the Atmega family in terms of architecture, features, and applications, highlighting four distinct differences between them.
(2) Describe the various communication interfaces supported by the Atmega328 microcontroller (e.g., UART, SPI, I2C), detailing the pin assignments and their functions in each interface.
(3) Discuss the significance of the memory organization in the Atmega328 microcontroller, including program memory (Flash), data memory (SRAM), and EEPROM, and their respective sizes and access times.

Q.4 (A) Draw the pin diagram of Atmega328p and describe the same. 05

(B) Draw a detailed functional block diagram of an Arduino microcontroller board, including essential components such as the microcontroller, power supply, USB interface, and communication interfaces. 05

OR

(B) Provide a comprehensive overview of the pinout configuration of an Arduino microcontroller board, including digital input/output (I/O) pins, analog input pins, power pins, and special function pins. 05

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