NATIONAL ACADEMY OF SCIENCE AND TECHNOLOGY
(Affiliated to Pokhara University)
Dhangadhi, Kailali
Pre-University Examination

Level: Bachelor   Semester: V_Fall   Year : 2024

Programme: B.E. Computer   F.M. : 100

Course: Embedded System   P.M. : 45

Time : 3hrs.

Candidates are required to give their answer in their own words as for as practicable. The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain the components and application areas of Embedded System.   7
   b) How I/O ports are configured in AVR microcontroller? Write a C program to configure PORT A and PORT B as output port and PORT C and PORT D as input port. Also, receive data from C and D and send them to A and B respectively.   8

2. a) Explain the different types of memory available in AVR microcontrollers.   8
   b) What are the registers associated with Timer0 and how would you use them to create a delay of 10miliseconds. Assume necessary data.   7

3. a) How does deadlock occur?   8
   b) Explain the significance of context switching in RTOS.   7

4. a) Mention the features of VHDL and the advantages associated with them.   8
   b) Write a VHDL program for full adder using two half adder and a or gate.   7

5. a) Write a VHDL program to detect a sequence '1011'.   7
   b) Write a C program for ATmega32 to display "Hello World" in a 16*2 LCD (4-bit mode).   8

6. a) Write differences between UART, I2C and SPI.   8
   b) Write about MQTT protocol used in IoT Communication.   7

7. Write short notes on **any two**:   2×5
   a) ATM as embedded system
   b) PWM
   c) Sensor