End Term Exam.5th Semester (Diploma)/DECE 501/ Nov. 2024

Embedded Systems

Full Marks: 100

Time: 3 hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

- 1 a) Draw the circuit diagram of interfacing an AC appliance through a relay at [2+4] a particular bit port of an MCU? Write a C program to control the appliance.
 - b) What do you mean by Scheduling and mention the function of real time [2+6] scheduler with necessary diagram and explanation?
 - c) Explain the principle of opto-coupler used in the embedded systems, show a [2+4] relevant example.
- 2. a) Draw the CDFG for the following pseudo code in C. [5+5]



- b) Mention the salient features of CAN. Draw the interface of CAN with an example [5+5] and discuss its communication steps.
- 3. a Draw the block diagram showing the I2C interface. Explain the protocols for I2C [2+4] bus.
 - b What do you mean by super loop based approach to the firmware design, [2+2] and provide a pseudo code as an example.
 - c) Mention the non-operational quality attributes of and Embedded system [5+5] and explain the product life cycle curve for an embedded System.
- 4 i) Explain the operation of USB communication interface used in embedded [5+5] systems and data rates supported by it.
 - ii) Draw the diagram of DB-9 connector, and mention the functionalities of the Pins [5]
 - iii) Mention the processor architectures based on execution style and explain with [5]

diagrams.



| Current State | Inputs | Outputs | Next State |
|---------------|-----------------|---------------|------------|
| State1 Ce | ntra Clk=2 tute | Of Tout holog | State2 |
| State2 | Clk=5 | out=2 | State3 |
| State3 | Clk=29 | out=3 | State2 |

- I. Draw an FSM for the above table.
- II. Write the pseudo code in C.

