BE1-R4: EMBEDDED SYSTEMS

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) What are the typical characteristics of an embedded system?
b) Explain shared data problem.
c) Define VoIP.
d) Differentiate between Bluetooth and Zigbee.
e) Explain Task Control Block (TCB).
f) In what ways CISC and RISC processors differ?
g) What is "MICRO C/OS II"? What are the real time system level functions in "UC/OS II"?

(7x4)

2.

a) What is a device driver? Is it a software or a hardware? What are the generic and control functions of a device driver?
b) Explain the processors in an Embedded Systems.

(9+9)

3.

a) What are the various types of I/O ports? Briefly give their specific details with reference to 8051.
b) Name any two queue related functions for the inter task communications.

(10+8)

4. What I2C (Inter Integrated Circuit) SERIAL BUS COMMUNICATION PROTOCOL? What are its characteristics and standards? Also mention the disadvantages of the same.

(18)

5.

a) Explain priority inversion problem.
b) What is Watchdog timer? What is software timer? How are they different from each other?

(9+9)

6.

a) What are the various features of VxWorks? Name some application for the VxWorks RTOS. What are the basic functions of VxWorks?
b) Explain Controller Area Networks (CAN).
c) Give some examples of asynchronous communications used in embedded systems. Also give their characteristics of asynchronous communications and specific clock features.

(8+6+4)

7.

a) What is the distinction Between Function, ISR and Task in embedded systems with respect to uses, calling source and context saving?
b) What is Fragmentation Memory Allocation Problems in RTOS?

(10+8)