

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 do you mean by embedded system? How is it differentiated from a general-purpose computer?
 - b) Differentiate between 8-16 bit microcontrollers.
 - c) Specify the requirements involved in embedded system design process.
 - d) What do you mean by embedded system design process? State its importance.
 - e) Given a choice to select RISC or CISC microcontroller, which one is preferred for embedded applications and why?
 - f) Explain how Port-based I/O is different from Bus-based I/O.
 - g) Specify the necessity of distinguishing the step system integration involved in embedded system design process.

(7x4)

2.
 - a) What are the benefits of using a general-purpose processor in the case of designing an embedded system? In this context, describe the benefits of using a standard single-purpose processor instead of using a general-purpose one.
 - b) Differentiate registers from memory. Compare Von-Neumann architecture and Harvard architecture. How is Cache memory related to embedded computing system?

(9+9)

3.
 - a) Explain architecture of UART.
 - b) Explain Task Control Block.

(9+9)

4.
 - a) Differentiate between Soft and Hard real time.
 - b) Explain priority inversion problem.
 - c) Differentiate between Assembler and Compiler.

(5+9+4)

5.
 - a) Explain architecture of 8-Bit microcontroller in detail.
 - b) Write a short note on Application-Specific Processors.
 - c) Differentiate between Caches and Virtual Memory.

(8+6+4)

6.
 - a) Describe the need for security in Bluetooth system. How Bluetooth wireless protocol is differentiated from IrDA?
 - b) Describe why an application developer may choose to run its application over UDP rather than TCP.

(12+6)

7. Write short notes on any **two** of the following:
 - a) DMA Controller
 - b) Watchdog timer
 - c) USB

(2x9)