BE1-R3: EMBEDDED SYSTEMS

NOTE:

1.	Answer question 1 and any FOUR questions from 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 is embedded system design process? State its importance.
b) Given a choice to select RISC or CISC micro controller, which one is preferred for embedded applications and why?
c) We are given tasks T_1 and T_2. What does it mean to say that they execute concurrently?
d) Provide a user level example of static and dynamic power management?
e) State Moore's Law. Comment on his recent prediction and state whether this law is applicable in the case of designing embedded systems.
f) Explain how Port-based I/O is different from Bus-based I/O.
g) Explain the difference between Black-box and White-box testing.

(7x4)

2.
a) What are the different optimizing design metrics involved in designing an embedded system? How are they competing with one another?
b) Write a short note on Application-Specific Processors.

(12+6)

3.
a) Characterize embedded computing applications in terms of (i) providing sophisticated functionality, (ii) performing to meet deadlines, and (iii) costs.
b) What is security modeling? State the objectives of security modeling.
c) What are the necessary conditions for deadlock to occur in a system?

(9+5+4)

4.
a) Describe the need for security in Bluetooth system. How Bluetooth wireless protocol is differentiated from IrDA?
b) "Concurrent programming is said to be harder than sequential programming." Do you agree with the statement? If yes, why? If no, how?

(12+6)

5.
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 Princeton architecture and Harvard architecture. How is Cache memory related to embedded computing system?

(9+9)

6.

a) Explain why in Mobile IP we have triangular routing. What is the main problem with route optimization?

b) Describe why an application developer may choose to run its application over UDP rather than TCP.

(11+7)

7.   Write short notes on any **three** of the following.
i)   Challenges in embedded system design.
ii)   Watchdog timer.
iii)   General structure of a CMOS logic circuit.
iv)   Design styles in IC design technology.
v)   Liquid crystal display controller.

(6x3)