

B.E. Seventh Semester (Information Technology) (CGS)
10750 : Real Time Embedded Systems : 7 IT 04

P. Pages : 2

Time : Three Hours



AU - 2921

Max. Marks : 80

- Notes :
1. Assume suitable data wherever necessary.
 2. Illustrate our answer necessary with the help of neat sketches.
 3. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) What is embedded system? Classify embedded system on the basis of its design and applications. 7
- b) Explain the process of converting assembly language program into machine code to obtain ROM image. 6

OR

2. a) What are the advantages offered by an ASIP for designing an Embedded system. 7
- b) Justify the use of physical and virtual devices drivers in embedded system. 6
3. a) How advanced processors with pipeline, superscalar, Multiply And Accumulate (MAC) unit helps to improve the performance of Embedded system? Justify with an example. 8
- b) Explain use of each control bit of I²C bus protocol. 6

OR

4. a) With the help of various structural units. Explain how an instruction is fetched and executed inside central processing unit 6
- b) Illustrate case study of following Embedded system in accordance with processor and memory section. 8
 - i) Real Time video processing system.
 - ii) Mobile phone.

5. a) What are the various elements in 'C' program? Explain pre-processor elements in details. 6
- b) Explain the role of queue for implementation of network protocol. 7

OR

6. a) Explain the importance of the following declarations. Static, volatile and interrupt in embedded C. 6
- b) What do you mean by Re-entrant function? When the function will be called as Re-entrant function? 7

SECTION – B

7. a) Draw and describe petri-net model for an ISR. 6
b) Enumerate the problems in sharing the memory by multiple task of real time application. 7

OR

8. a) What do you understand by state machine programming models for event controlled program flow? Explain with an example. 7
b) Differentiate process, thread, task in RTOS with an example. 6
9. a) Explain how semaphores can be used to solve the shared data problem in multiprocessor system. 7
b) What is meant by pipe? How does a pipe differ from a queue. 6

OR

10. a) What is a mailbox? How does a mailbox pass a message during an IPC. 6
b) Define critical section of a task. What are the ways by which the critical section blocking other process(es). 7
11. a) Explain co-operative Round-Robin scheduling using a circular queue of ready task. Draw relevant diagram and explain. 6
b) Explain following Real-Time system performance metrics with example 8
i) Throughput
ii) Interrupt Latencies
iii) Average response times.
iv) Deadline Misses.

OR

12. a) Explain the implementation of preemptive scheduling model for scheduler in embedded system. 8
b) What are the various operating system security issues? 6
