

Total No. of Questions : 10]

SEAT No. :

P3987

[5561]-692

[Total No. of Pages : 2

B.E. (Computer Engineering)

EMBEDDED AND REAL TIME OPERATING SYSTEM

(2015 Course) (Elective - III) (Semester - II) (410252(C))

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.

- Q1)** a) What is the use of ROM image in Embedded system? Draw a structure of ROM image and explain various components embedded inside it. [5]
b) How does ARM micro-controller differ from a SHARC processor? Justify your answer. [5]

OR

- Q2)** a) Describe in detail different forms of memories and their use in embedded systems. [5]
b) To design sophisticated embedded systems for high computing performance, which performance metrics are used? Explain. [5]

OR

- Q4)** a) Explain why PCI/X buses are used for high speed data transfer? List the major features of PCI/X bus. [5]
b) Describe and compare RS232C and SDIO Devices. [5]

- Q5)** a) How to represent Precedence constraints and data dependency among real-time tasks? Explain with diagram. [6]
b) How Rate Monotonic (RM) algorithm checks the schedulability of tasks? What are limitations of RM algorithm. [6]
c) What is RTOS? Differentiate Hard versus soft real-time systems and their timing constraints. [4]

OR

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- Q6)** a) Differentiate between fixed priority and dynamic priority scheduling algorithms in real-time systems. Give one example of each. [6]
b) What are various Temporal parameters of real-time processes? List and explain. [6]
c) What are various Real-time requirements in the domain of Signal processing or Multimedia. [4]

- Q7)** a) With the help of example, demonstrate the concept of critical section. [6]
b) What is priority inversion problem in real-time systems? How this problem can be solved? Give details. [6]
c) What is interrupt latency? Justify its role in handling interrupts in RTOS environment. [4]

OR

- Q8)** a) Explain with example Resource conflicts and blocking. [6]
b) What is Semaphore? How does it help in resource sharing in RTOS Kernel? [6]
c) How interrupts are handled in RTOS environment? [4]

- Q9)** a) Draw and explain model of real-time communication with related terminologies. [6]
b) Explain priority-based service disciplines for switched networks in multiprocessor systems for real-time communication. [6]
c) Describe the embedded software development process. [6]

OR

- Q10)** a) What are issues in resource reservation. Explain Resource reservation protocol with diagram. [6]
b) Explain with example Validation and debugging in an embedded system. [6]
c) List capabilities of commercial real-time operating systems. Enlist the features of RTLinux. [6]

