

Code No: R41042

R10

Set No. 1

IV B.Tech I Semester Regular Examinations, December 2013

EMBEDDED SYSTEMS

(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

Time : 3 hours

Max. Marks: 75

**Answer any Five Questions
All Questions carry equal marks**

1. a) Explain in detail about Embedded system design process with examples?
b) Explain the difference between Embedded System and general computing systems?
2. a) Write a short note on characteristics of Embedded Computing Applications?
b) Write briefly about application specific embedded systems
3. a) Differentiate among various methods for intertask communication?
b) Explain i) Serial communication devices, ii) parallel device ports.
4. a) Explain DMA transfer mechanism and how you interface to the processor ?
b) Explain shared data problems in Embedded system? Also explain Interrupt control and interrupt latency ?
5. a) Explain task, task state, semaphore and shared data?
b) Explain the action plan for designing an RTOS based embedded system in its development Process.
6. a) Explain the differences between an 'Host Computer System' and a 'Target System' in terms of their hardware and software?
b) What are the devices that can be connected through IEEE 1394 Bus? Explain its limitations.
7. a) Define hardware /Software Co-simulator ?
b) What is a key method for speeding up such simulator ?
8. a) List and describe the translation tools used in an Embedded system
b) Explain about Laboratory instruments for testing the embedded system

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**Answer any Five Questions
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1. a) Write a short notes on characteristics of Embedded Computing Applications?
b) Explain the formalism for Embedded system design?
2. a) Explain the components of an Embedded system hardware
b) Write briefly about domain specific embedded systems?
3. a) How do you solve the problem of interface specific data types?
b) Explain the PCB layout design.
4. a) What is ISR and briefly explain.
b) Explain any three POSIX system calls with proto-type and give example for each.
5. a) How numerous operations permitted by the concurrent process model are implemented by using single or general purpose processors?
b) Explain how the task for reading ports synchronizes with the port device driver.
6. a) Explain the functions of a scheduler in an RTOS and how does the scheduler carryout those functions.
b) Explain about the fundamental issues in hardware software Co design ?
7. a) Explain about the embedded software development process and tools ?
b) Explain about boundary scan.
8. a) Explain about Laboratory instruments for testing the embedded system
b) Write short notes on quality assurance and testing of the embedded system design?

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Set No. 3

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**Answer any Five Questions
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1. a) Explain various models in detail that are commonly used for describing the Embedded system ?
b) What are the challenges in Embedded computing system design Explain briefly
2. Explain quality attributes of embedded systems.
3. a) With a neat sketch explain the hardware for RS232 interface?
b) Explain basic design using RTOS Explain hard real time scheduling consideration
4. What are the different methods by which an RTOS finds out that an interrupt routine is executing. Compare these methods with respect to the interrupt response time and ease of coding.
5. a) explain the implementation of creating and terminating process?
b) With a help of examples explain how scheduling processes are implemented?
6. a) What is meant by hardware and software co-design. Explain hardware software Trade-offs.
b) Explain about the computational models in embedded system design?
7. a) Define the following terms related to embedded system design
i) Emulators ii) instruction set simulator
b) How the target hardware debugging done in design of embedded system design?
8. With respect to embedded RTOS compare among the following :
 - a) Mailbox
 - b) Message queue
 - c) Event Register
 - d) Pipes.

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**Answer any Five Questions
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1. a) List the various commercially available embedded operating systems and explain their features?
b) Give the classification of Embedded systems?
2. a) Explain in detail the process of building software for Embedded system?
b) Write a short notes non-quality attributes of Embedded systems.
3. a) With the help of neat sketch explain RS422/RS485 in detail?
b) Define critical section? Explain it with suitable example?
4. a) Explain about Embedded firmware design approaches.
b) Explain the concepts of C versus embedded C and cross compilers?
5. a) Explain the functions of a scheduler in an RTOS and how does the scheduler carryout those functions?
b) explain message queues,mail boxes and pipes and events. Give examples?
6. a) Write a short notes on Integration of hardware and Firmware.
b) Explain about the computational models used in embedded system design?
7. a) Describe a ROM Emulator
b) Describe an In-Circuit-Emulator
c) List the Difference between ROM Emulator and In-Circuit-Emulator
8. Explain the important features of the following that are relevant to embedded system
 - a) Compilers & Linkers
 - b) laboratory tools