

Second Semester M.Tech. Degree Examination, June-July 2009

Embedded Computing Systems

50

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. What is an embedded system? What are the three important components of an embedded system? What are its characteristics & constraints? Explain in brief. (06 Marks)
- b. Explain in brief the following embedded hardware & devices in system, highlighting their role.
- i) Real time clock (RTC) ii) Watchdog-Timer reset
- iii) LCD & LED iv) Interrupt handler (08 Marks)
- c. With neat diagram, explain the concept of SoC. (06 Marks)
- 2 a. With a neat diagram explain the design concepts & the activities for software design during embedded software development process. (08 Marks)
- b. What are the important challenges in Embedded system design? Discuss in brief. (04 Marks)
- c. With necessary hardware, explain the smart card embedded system highlighting embedded software required for the same. (08 Marks)
- 3 a. Explain the two modes of communication using serial devices with an example for each. Also describe and compare RS232C and UART devices. (10 Marks)
- b. Describe ISA parallel Bus. (05 Marks)
- c. What are internet-enabled systems? List the different protocols used in these systems. (05 Marks)
- 4 a. Describe the programmed I/O with interrupt concept. Illustrate the same with a practical example. (10 Marks)
- b. What are the different sources of interrupt? Give one example for each type. Also describe in brief the interrupt servicing mechanism. (10 Marks)
- 5 a. Describe the following with an example for each:
- i) Context switching ii) Interrupt latency iii) Deadline. (06 Marks)
- b. Why there is a need for device drivers? What are their features? List the points that are to be known before writing a device driver. (06 Marks)
- c. What are virtual device drivers? Give an example. With neat diagram, explain how would you implement read function using an ISR. (08 Marks)
- 6 a. With neat block schematic explain how would you get an embedded software into the target system? (06 Marks)
- b. Discuss the issues in hardware & software co-design. (04 Marks)
- c. With neat block schematic explain DFG model. (04 Marks)
- d. With neat block schematic explain FSM model. (06 Marks)
- 7 a. List and explain important goals of an OS. (06 Marks)
- b. What is kernel? List and explain the services it provides. (04 Marks)
- c. Describe process and device management services OS in brief. (06 Marks)
- d. Describe the message oriented ISR calling mechanism. (04 Marks)
- 8 a. With a neat diagram explain cooperative scheduling of Ready tasks using precedence constraints. Also estimate worst case latency. When do you prefer using cyclic and round robin with time slicing scheduling strategy? Illustrate with an example. (12 Marks)
- b. With neat block schematic explain the concept of Host system and Target system. Also describe in brief the linking process. (08 Marks)
