UNIT – I

INTRODUCTION & EMBEDDED COMPUTING PLATFORM

1. (a) Explain about the details of other hardware units available in embedded system. [5M]
   (b) Describe in detail about embedded system on-chip with necessary sketch. [5M]

2. (a) Discuss about the factors to be considered for selection of processor in embedded system. [5M]
   (b) Illustrate with example the techniques used for memory devices. [5M]

3. (a) Write the need for software in embedded systems. [5M]
   (b) What do you mean by system-on-chip (SOC). [5M]

4. (a) What are the different memory devices used in embedded systems? [5M]
   (b) Explain input output devices used in embedded systems. [5M]

5. (a) What is system on chip? Explain embedded systems change with system on chip. [5M]
   (b) What is processor architecture? What are the different processor architectures available for processor design? [5M]

6. (a) Explain the RS232/UART communication interface. [5M]
   (b) Explain the RS422/RS485 communication interface. [5M]

7. (a) Explain about the components used as core of an embedded system. Also mention their commonly used application. [5M]
   (b) Explain the need for software in embedded systems. [5M]

8. (a) Compare Harvard and Princeton memory organization. [5M]
   (b) Explain the input and output devices used in embedded systems [5M]

9. (a) What is an embedded system? List out its applications. Explain why the processors play a vital role in embedded systems. [5M]
   (b) How the software is embedded on to the system? Explain. [5M]

10. (a) Explain the techniques used for selection of memory in embedded systems. [5M]
    (b) Discuss the functions of CPU bus. [5M]
UNIT II
SURVEY OF SOFTWARE ARCHITECTURE & EMBEDDED SOFTWARE DEVELOPMENT TOOLS

1. (a) Explain the architecture of I2C bus with neat sketch. [5M]
   (b) Compare the important features of ISA, PCI & PCI-X. [5M]
2. (a) Discuss about round robin architecture. [5M]
   (b) Write about round robin with interrupts architecture. [5M]
3. (a) Explain the section of memory in the embedded systems. [5M]
   (b) Explain embedded software development tools of host and target machines. [5M]
4. (a) What are advantages DMA based data transfer over the interrupt driven data transfer? [5M]
   (b) Write about the locations for embedded software. [5M]
5. (a) (a) Discuss the advantages and disadvantages of data transfer using serial and parallel ports. [5M]
   (b) Explain embedded software development tools of linkers. [5M]
6. (a) Write about function queue scheduling architecture. [5M]
   (b) Explain parallel port device drivers development procedure. [5M]
7. (a) Compare round robin, round robin with interrupts and function queue scheduling architecture. [5M]
   (b) Explain the parallel communication between the networked I/O devices using PCI bus with diagram. [5M]
8. (a) Differentiate parallel port and serial port device drivers. [5M]
   (b) Explain about the concept of context switching in multiple interrupt mechanism. [5M]
9. (a) Classify I/O devices, timers and counting devices. [5M]
   (b) What is meant by DEBUG? Write any one method in detail. [5M]
10. (a) Illustrate the debugging technique in embedded systems. [5M]
    (b) Explain selecting an architecture saving memory space. [5M]

UNIT III
RTOS CONCEPTS

1. (a) Explain interrupt service mechanism. How priority interrupts can be handled? [5M]
   (b) Discuss about the special features of SHARC processor as compared with ARM processor. [5M]
2. (a) Write a short note on processor and memory organization. [5M]
   (b) Briefly explain about pipes used in embedded systems. [5M]
3. (a) Explain the operation of semaphore in detail.  
(b) Explain pipe management function calls.  

4. (a) Write about embedded system networks.  
(b) Briefly explain about different data operations used in ARM processor.  

5. (a) Compare Von-Neumaan and Harvard architecture.  
(b) Discuss about various functions in semaphore.  

6. (a) Explain Message Queue with an example.  
(b) How system development process can be achieved in H/W and S/W co-design?  

7. (a) What is meant by kernel? Explain the kernel architecture in detail.  
(b) How many general purpose registers are in the SHARC programming model?  

8. Explain the following:  
   (i) Interrupt service routines.  
   (ii) Semaphores.  
   (iii) Message queues.  

9. (a) Explain different styles of computer architecture and the nature of assembly language.  
(b) Write about the architecture of kernel in brief.  

10. (a) Explain in detail about the interrupt service routine.  
     (b) Write about the message queues in depth.  

UNIT –IV  
INSTRUCTION SETS  

1. (a) Discuss the instruction set available in ARM processor with example.  
     (b) Discuss about the special features of SHARC processor as compared with ARM processor.  

2. (a) Write a short note on processor and memory organization.  
     (b) Briefly explain about different data operations used in ARM processor.  

3. (a) Explain the operation of BL instruction. Also mention the state of ARM registers before and after its operation.  
     (b) Explain the general purpose registers in SHARC programming model.  

4. (a) Explain the instruction set simulator.  
     (b) Briefly explain about different data operations used in ARM processor.  

5. (a) Compare Von-Neumaan and Harvard architecture.  
     (b) Discuss about various data operations of the SHARC processor with example.
6. (a) Explain RAM instruction set architecture.  [5M]
   (b) Differentiate ARM and SHARC processors.  [5M]
7. (a) Explain any five instructions with an example.  [5M]
   (b) How many general purpose registers are in the SHARC programming model? [5M]
8. (a) Explain different styles of computer architecture and the nature of assembly language. [5M]
   (b) Write in detail about the instruction set.  [5M]
9. (a) Write about the preliminaries in detail.  [5M]
   (b) Write about the classification of instruction.  [5M]
10. (a) Explain in detail about the types of ARM processors. [5M]
    (b) Write a short note on inter process communication in embedded programming. [5M]

UNIT V
SYSTEM DESIGN TECHNIQUES & DESIGN EXAMPLES

1. (a) Explain the basic constraints of embedded system project management.  [5M]
   (b) Discuss about the design issues in embedded system development process.  [5M]
2. (a) Explain the need for project management in embedded system and write its advantages.  [5M]
   (b) Explain how the hardware testing is performed in embedded systems by using logic analyser. [5M]
3. (a) Write the difference between target system and final embedded system.  [5M]
   (b) Explain telephone PBX.  [5M]
4. (a) What is meant by design methodology? Explain any two methodologies.  [5M]
   (b) Explain inject printer.  [5M]
5. (a) (a) Explain the various issues involved in embedded system design.  [5M]
   (b) What is target system? How does the target system differ from embedded system?  [5M]
6. (a) Explain system analysis and architecture design.  [5M]
   (b) Write about the applications of design methodologies.  [5M]
7. (a) Explain water tank monitoring system.  [5M]
   (b) Write in detail about GPRS.  [5M]
8. (a) Explain any one of design examples of embedded systems.  [5M]
   (b) Explain design methodology requirements analysis.  [5M]
9. (a) Explain personal digital assistants.  [5M]
   (b) Write in detail about system design technique.  [5M]
10. Explain the following:
   (i) Telephone PBX. [4M]
   (ii) Inkjet printers. [3M]
   (iii) Set top boxes. [3M]

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