Q.1

a. List the different types of rapidly emerging distributed embedded system. Also mention their features.

b. Explain the use of the following tools: ICE, CROSS –ASSEMBLER.

c. List all software modules and tools for implementation of an embedded system.

d. List design issues in embedded system multimedia application of Digital Camera.

e. What is a “market window” and why is it so important for products to reach the market early in this window.

f. The design and configuration of caches can have a large impact on performance and power consumption of a system. Justify.

g. Explain the main features of two popular parallel protocols. (7×4)

Q.2

a. What is an embedded system and list applications of that? List and define the three main characteristics of embedded systems that distinguish such systems from other computing systems. (10)

b. List and define the three main IC technologies. What are the benefits of using each of the three different IC technologies? (8)

Q.3

a. Compare Harvard architecture and Princeton architecture and explain how control unit works in basic general-purpose architecture. (10)

b. What is an addressing mode? Explain different addressing modes used to indicate the data’s location in assembly language programming. (8)

Q.4

a. Why composing of larger memory is required from smaller memory parts. Explain how you will approach this method. (10)
b. Discuss the advantages and disadvantages of using memory-mapped I/O versus standard I/O mapped.  

Q.5  

a. Draw system architecture of DMA using the ISA bus protocol and explain its memory write bus cycle.  

b. Draw two-level bus architecture of microprocessor-based embedded system and explain it.  

Q.6  

a. Memory allocation and management are the most important functions of the kernel. Why? How does memory allocation differ in RTOS and OS? What is memory locking?  

b. Explain the different methods of saving and optimizing the memory space.  

Q.7  

a. Describe an I²C bus at the following OSI-compliant levels of detail: physical, data link, network, and transport.  

b. Explain protocol that would allow sensor nodes in a sensor network to determine the other nodes with which they can communicate.