PART – A

Answer all questions in Part A. Each question carries 4 marks.

1. List the characteristics of an embedded system.

2. Explain briefly the following:
   i) RTOS
   ii) Cross compiler.

3. List the design metrics of an embedded system.

4. Write a SCON register format.

5. Write a C program to read 2 digits BCD from port 1 convert to binary and send on port 2 continuously.

6. Explain how memory allocations are done by 8051 compiler.

7. Write an 8051 C program to send values 00 – FF to port P1.

8. List the two rules that ISR must follow in RTOS environment.

9. Briefly explain multitasking systems.

10. Explain the concept of structured programming. (10×4=40 Marks)

PART – B

Answer any one full question from each Module.

Module – 1

11. a) Describe the various components of embedded system hardware with neat block diagram.

   b) Describe different types of embedded system with example.

   OR

   P.T.O.
12. a) Distinguish between host system and target system. Explain software tools needed at the host and how does the target system differ from the final embedded system?  
   
b) Explain the different software life cycle models with the help of block diagrams.  

Module – 2

13. a) Along with the block diagram explain the architecture and its features of 8051 microcontroller.  
   
b) What are addressing modes? Explain the different types of addressing modes used for accessing data in 8051, each with two examples.  

OR

14. a) Complete the following instructions with suitable registers and explain their function  
   i) MOVC  
   ii) DJNZ  
   iii) CJNE  
   iv) SETB  
   v) SWAP.  
   
b) Discuss the various types of jump and call instructions of 8051 microcontroller.  

Module – 3

15. a) Interface 4 x 4 keyboard to 8051 and write an ALP to detect the key pressed.  
   
b) Write an 8051 C Program to send the two messages “Normal Speed” and “High Speed” to the serial port. Assuming that SW is connected to pin P2.0, monitor its status and set the baud rate as follows: SW = 0, 28.800 baud rate SW = 1, 56 K baud rate assume that XTAL = 11.0592 MHz for both cases.  

OR

16. a) Write an 8051 C program to toggle bits of P0, P1 ports continuously with a 300 ms delay.  
   
b) Write a C program that continuously gets a single bit of data from P1.7 and sends it to P1.0, while simultaneously creating a square wave of 200 μs period on pin P2.5. Use timer 0 to create the square wave. Assume that XTAL = 11.0592 MHz.