



-
- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answer whenever necessary with the help of neat sketches.

1. a) List and explain Embedded system project Management's four components. 5
b) Why RTOS is required for an Embedded system? Can ES work without RTOS? 5
c) Define Emulator with proper example. 3
- OR**
2. a) Explain design cycle with proper diagram in the development phase for an Embedded system. 7
b) Write a short note on following. 6
 - i) In-circuit emulator.
 - ii) Use of software tool for development of an ES.
3. a) Explain concept of semaphore. Draw and explain in detail execution flow with semaphore. 8
b) The following routines are called by Task A,B and C, but they don't work. How would you fix the problem? 6

```
Static int iRecordCount;
Void increment_records (int iCount)
{
OSSemGet (SEMAPHORE_PLUS);
iRecordCount += iCount;
}
Void decrement_records (int iCount)
{
iRecordCount -= iCount;
OSSemGive (SEMAPHORE _ MINUS)
}
```
- OR**
4. a) Write a short note on :
 - i) Priority inversion problem. 4
 - ii) Mutex. 3
 - iii) Virtual sockets. 3

- b) Draw and explain task states in RTOS. 4
5. a) Give the detail Case Study of Digital Camera. 7
- b) Explain the following question with proper diagram regarding interrupt in 8051. 6
- i) How interrupt routine should work?
- ii) What would really happen?
- iii) How interrupt routine do work?
- OR**
6. a) Give the detail Case Study of GPS. 7
- b) Explain Real time Operating System services in detail. 6
7. a) Show the content of the PSW register after execution of the following instructions. 6
- MOV A, # 0BFH
ADD A, # 1BH
- b) For an 89C51 with a crystal frequency of 22 MHz. find a time delay for the following loop inside loop. 8
- DELAY: MOV R2, # 19
HERE : MOV R3, # 255
AGAIN : DJNZ R3, AGAIN
 DJNZ R2, HERE
 RET
- OR**
8. a) Write a short note on : **any two.** 8
- 1) CALL Instructions.
- 2) 8051 Register Banks.
- 3) 8051 Counter.
- b) Explain various addressing modes of 8051. 6
9. a) Explain serial port control register with proper diagram. 6
- b) Write a short note on basics of serial communication, 7
- OR**
10. a) Write a program to generate two square wave - one of 5KHz frequency at pin P 1.3 & another of freq. 25 KHz at pin 2.3. Assume XTAL = 22 MHz. 8
- b) Explain TCON register and its role in handling interrupts. 5
11. a) Explain in detail various kinds of semi conductor memories & their characteristics. 6
- b) Draw and explain interfacing an LCD to the 8051. 7
- OR**
12. a) Draw and explain interfacing a DAC to the 8051. 7
- b) Draw and explain 8051 interfacing to the keyboard. 6
