B.E.Sixth Semester (Computer Technology) (C.B.S.)
Embedded System Design

P. Pages : 2

Time : Three Hours

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Max. Marks : 80

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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 answers whenever necessary with the help of neat sketches.

1. a) Write short note on : **7**
    i) EPROM Emulator.
    ii) Components of Embedded system.

   b) Draw Microcontroller architecture and compare it with microprocessor. **3**

   c) Mention application areas of embedded system. **3**

OR

2. a) A scheduler is a part of real time operating system and it keeps track of the states of each block. Answer the following question about the scheduler and task states.

    i) How does the scheduler know when a task becomes blocked or unblocked ? **3**

    ii) What happens if two states with same priority are ready ? **3**

    iii) What happens if all the tasks are locked ? **3**

   b) Explain how software can be embedded into the target system. **4**

3. a) How Semaphores is used to solve the shared data problem ? Explain with examples and neat sketches. **7**

   b) What is priority inversion problem in RTOS with regard to their solution priority inheritance protocol ? **6**

OR

4. a) Write short note on **any four.**
    i) RPC (Remote Procedure Call) **3**
    ii) Message queue. **3**
    iii) Mailboxes. **3**
    iv) Pipes **2**
    v) Virtual (logical) sockets **2**

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5.	a)	How real time operating system differs from a normal operating system ? Why RTOS is necessary in Embedded system ?	**6**
	b)	Define Real time operating system. Mention the names of some commercial RTOS available in market.	**4**
	c)	What are the three states of an RTOS task ? Explain.	**4**

OR

6.	a)	Explain interrupt routines in an RTOS environment.	**7**
	b)	Define interrupt latency and response time of the task.	**7**

7.	a)	Explain the following directives used in 8051.	**8**

i)   DB   ii)   ORG
iii) EQU   iv)   END

	b)	Mention and explain the 8051 flag bits and PSW register.	**5**

OR

8.	a)	Write and explain different addressing modes supported by 8051.	**6**
	b)	Draw a block diagram of 8051 microcontroller and write its unique features relevant to embedded system design requirement.	**7**

9.	a)	Explain Interrupt priority in the 8051.	**7**
	b)	Explain timer / counter of 8051 in detail.	**7**

OR

10.		Write short note on :	
	i)	RS-232	**4**
	ii)	UART	**4**
	iii)	I^2C BUS	**3**
	iv)	USB	**3**

11.	a)	Write a program that continuously gets 8-bit of data from P_0 to send it to P_1 while simultaneously creating a square wave of 200 μs period on pin $P_{2.1}$. Use timer 0 to create square wave XTAL = 11.0592 MHz.	**7**
	b)	Explain steps to execute an interrupt.	**6**

OR

12.	a)	Give the interfacing of LCD to the 8051. Explain in detail.	**6**
	b)	Generate the sine wave as an example of interfacing A DAC to the 8051. Explain in detail.	**7**

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