

FACULTY OF INFORMATICS

B.E. 4/4 (IT) II – Semester (Old) Examination, April / May 2014

Subject : Embedded Systems**Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 When comparing a system board based on a microcontroller and a general purpose processor which one is cheaper? Why?
- 2 What is the major difference between 8051 and 8052?
- 3 Write the relative address range of SJMP and LJMP with its syntax.
- 4 Which timer of 8051 is used to set the baud rate?
- 5 What is the difference between RET and RETI?
- 6 Give an example for Kernel controlled entity and a process controlled entity.
- 7 Differentiate simulator and emulator.
- 8 Write notes on linker and locator.
- 9 List out any three real time examples for ARM processor.
- 10 Explain interrupt routines in RTOS environment.

PART – B (50 Marks)

- 11 a) Elucidate the formalisms for system design. 5
b) Illustrate a control oriented and computation oriented embedded system with an example. 5
- 12 a) Write short notes on Jump and call instructions with examples. 5
b) Explain following special function registers TRO, TRI, TCON and TMOD with examples. 5
- 13 a) Write short notes on serial port programming and also explain SBUF and SCON registers. 5
b) The string "OSMANIA UNIVERSITY" is to be transferred to the serial port. Calculate the value to be loaded into TH1 for following baud rates. 5
i) 9600 ii) 2400 iii) 1200
- 14 a) Explain multitasking in RTOS environment. 5
b) Consider a microwave oven, illustrate its special features and operations with tasks and task states. 5
- 15 a) Explain semaphores and message queues. 5
b) Illustrate round robin priority scheduling with a simple practical example. 5
- 16 a) Write short notes on ARM processor and its memory organization. 5
b) Explain the instruction sets supported by ARM. 5
- 17 a) Explain I²C bus protocol in detail with neat diagrams. 5
b) Explain operational features and significance of internet enabled system. 5

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B.E. 4/4 (I.T.) II-Semester (New)(Main) Examination, April / May 2014

Subject : Embedded Systems

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part - B.**PART – A (25 Marks)**

- 1 Draw and explain the structure of PSW of 8051 (3)
- 2 What is the functions of Parallelism in I2C Bus ? (2)
- 3 What is interrupt? Explain IE Register of 8051 (3)
- 4 Explain Rotate and Swap operations in 8051 (2)
- 5 How does CAN differ from I²C? (3)
- 6 What is a Logic Analyzer? (2)
- 7 Explain the DAA instruction in 8051 microcontroller with an example. (2)
- 8 List the differences between an Emulator and In-circuit emulator (ICE) with a diagram. (3)
- 9 List the Interrupts in ARM Processor (3)
- 10 Distinguish between Cross Compiler and Compiler (2)

PART – B (50 Marks)

- 11 (a) Explain the important problems / challenges that must be considered while designing an embedded system. (5)
- (b) Explain Architecture design steps in design process of an Embedded System. (5)
- 12 (a) Assume that register A has packed BCD. Write an assembly language program to convert packed BCD to two ASCII numbers and place them in registers R6 and R7. (6)
- (b) Describe the usefulness of Special Function Registers (SFRs) in 8051 Microcontroller. (4)
- 13 (a) Assume that 5 BCD data items are stored in RAM locations starting at 60H, as shown below. Write a program to find the sum of all the numbers. The result must be in BCD. (5)
 - 60 = (33)
 - 61 = (1A)
 - 62 = (45)
 - 63 = (27)
 - 64 = (1E)
- (b) Write an ALP to find the Number of 1's in a given byte. (5)
- 14 (a) What is a semaphore? Explain with an example how semaphores are used for solving the shared data problem. (5)
- (b) Explain about Interrupt Routine in an RTOS. (5)
- 15 (a) Write about the embedded software development tools. (5)
- (b) Explain Debugging techniques in embedded systems. (5)
- 16 (a) What is the purpose of Register banks? Explain the different types of Register banks in 8051 Microcontroller. (5)
- (b) Write short notes on A/D and D/A Converters. (5)
- 17 Write detailed notes on the following: (10)
 - (a) ARM Processor architecture
 - (b) CAN Protocol
