

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1722906****Date: 12/07/2012****Subject Name: Embedded & Real Time System****Time: 10:30 am – 13:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Enlist and explain common characteristic of an embedded system with suitable example. **07**
Compare full-custom and semi-custom IC Technology.
- (b) What are the differences between a Microprocessor and a Microcontroller? Enlist various Embedded products based on Microcontrollers. Draw and explain Pin Diagram of 8051 Microcontroller. **07**
- Q.2** (a) What are the advantages of using standard single purpose processor over general purpose processor? Enlist and explain standard single purpose processor peripherals. **07**
- (b) Explain RAM allocation and bit allocation of PSW in the 8051 Microcontroller. Show the status of the CY, AC and P Flags after the addition of 48H and 3FH in the following instructions. **07**

MOV A, #48H
ADD A, #3FH

OR

- (b) Write short note on: Semaphores-deadlock- process stack management. **07**
- Q.3** (a) Compare general purpose processor, application- specific processor and single-purpose processor in tabular form.. **07**
- (b) Explain ADC/DAC Interfacing to the 8051 Microcontroller. For a given ADC0848, if $V_{ref}=2.56V$, calculate the output voltage in decimals if the analog input is: (i) 2.8V (ii) 1.5V (iii) 3.5V. **07**

OR

- Q.3** (a) Enlist and explain different types of 8051 addressing modes with two examples. **07**
- (b) Explain in detail round robin primitive rate monotonic foreground and background systems. **07**
- Q.4** (a) What are the benefits of utilizing Custom single purpose processor over general purpose processor? Explain sequential logic design and combinational logic design in custom single purpose processor. **07**
- (b) Discuss in detail Timer(s) of 8051 microcontroller. Obtain timer's clock frequency and its period for various 8051-based systems, with the following crystal frequencies. **07**
(i) 10 MHZ (ii) 12.0562 MHZ (iii) 24 MHZ.

OR

- Q.4** (a) Enlist and explain different types of semiconductor memories. Also discuss important terminology common to all semiconductor memories. **07**
- Q.4** (b) What is the basic difference between UART and USART? Explain in detail USART. **07**
- Q.5** (a) Explain DC Motor Interfacing with 8051 Microcontroller. **07**
- (b) What are the basic steps involved in executing an interrupt? Enlist and explain interrupts for 8051 Microcontroller. Which interrupt(s) has the highest priority? **07**

OR

- Q.5** (a) Explain Stepper Motor Interfacing with 8051 Microcontroller. **07**
- (b) Discuss utility of Interrupt. Describe in detail the interrupt driven system. **07**
