(b) Write an assembly language programming to multiply two 8 bit numbers.

9. Write short notes on the following :

(a) Interfacing external memory

(b) Directives of 8051

(c) 8051 serial communication programming

(d) ES design life cycle.

Roll No.....

A

Total No. of Questions : 9]

[Total No. of Printed Pages : 4

EC–306

MICROCONTROLLER AND EMBEDDED SYSTEM (NEW)

(B.Tech., 6th Semester, 2055)

Time : 3 Hours Maximum Marks : 60

Note :– Section A is compulsory. Attempt any *Four* questions from Section B and any *two* questions from Section C.

Section–A Marks : 2 Each

1. (a) List advantages of Microcontroller for some applications. Name *three* features of the 8051.

(b) Which register bank is used if we alter RS0 and RS1 of the PSW by the following two instructions ?

SETB PSW-3

SETB PSW-4.

(d) What is the role of stack in call instruction ?

(e) Explain the use of Port-3 for interrupt signals.

(f) Write a program to clear 16 RAM locations starting at RAM address 60 h.

(g) Which registers are allowed to be used for register indirect addressing mode if the data is in on-chip RAM ?

(h) Write a program to create a square have of 50% duty cycle on bit 0 to port 1.

(i) Define the RS 232 standard.

(j) List instruction command codes for programming an LCD.

Section–B Marks : 5 Each

2. Describe the various modes of the 8051 timers. Write a program in 8051 to generate time delay of 1 sec.

3. Assume that INT1 pin is connected to a switch that is normally high whenever it goes low, it should turn on LED. The LED is connected to P1.3 and is normally off. When it is turned on it should stay on for a fraction of second. As long as the switch is pressed low, the LED should stay on.

4. Write an assembly language programming for performing 16 bit addition.

5. Draw a suitable interface circuit to interface DAC 808 with microprocessor. Write down program to generate triangular wave shape.

6. Draw the block diagram of 8051.

Section–C Marks : 10 Each

7. Discuss various addressding modes of 8051 with examples.

8. (a) What do you understand by embedded system ? List its various design parameters.

Roll No .....

Total No. of Questions : 09]

[Total No. of Pages : 02

J-302[6011A]

[2126]

B.Tech. (Semester - 6th & 7th)

MICROCONTROLLER AND EMBEDDED SYSTEMS (EC - 306)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

1) Section - A is **compulsory.**
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 x 2 = 20)*

a) What are the must have 'on-chip devices' in microcontroller?

b) Name any two other members of 8051 family along with their important specifications?

c) Explain the DB and EQU directives.

d) Define AC and OV bits PSW register.

e) What is the size of SP register in 8051? Give its default content on start up?

f) Differentiate the 'LCALL' and 'ACALL'.

g) What is the advantage of using 'SJMP' over 'LJMP'?

h) Explain bits of TMOD register.

i) Assuming XTAL = 11.0592 MHz, calculate the count to be loaded in the timer for generating 50 Hz square wave.

j) Show status of the AC and P flags after addition of 88H and 93H in accumulator.

P.T.O.

Section - B

(4 x 5 = 20)

Q2) Write an assembly language program to add three 8-bit numbers. Put the sum in registers R0 (Low Byte) and R1 (High Byte).

Q3) Explain different addressing modes of 8051.

Q4) Write a program to load the accumulator with 8-bit number and complement it 500 times.

Q5) Give number of timers on 8051 and explain timer modes.

Q6) Define embedded system. Give its characteristics.

Section - C

(2 x 10 = 20)

Q7) (a) Write a short note on present trends in embedded systems.

(b) Which timer and mode of timer of 8051 is used set the baud rate? Give an example.

Q8) (a) Explain various bits of the SCON register.

(b) Write an assembly language program to monitor P1.2, when it becomes high write 55H to port 0 and send a pulse of known period to P2.1.

Q9) Show schematic of interfacing of keyboard with 8051. Also give flowchart and assembly language program to read the keyboard.

Micro-controller & Embedded System
(EC-306, Dec-2007)

Note: Section A is compulsory. Attempt any four questions from Section-B and any two from Section-C.

Section-A

1. a) To which register does the SMOD bit belong? State the role in rate of data transfer?
   b) Discuss the IE (Interrupts register) contents in detail.
   c) In which categories we can divide Interrupts related to 8051.
   d) Why do we need interface circuit for applications of Micro-controller?
   e) Write a program to see whether the accumulator is divisible by 8.
   f) Write the instructions to save the CY & AC flags in bit locations 4H & 5H respectively.
   g) When TI & RI flag bits are raised?
   h) Explain the difference between the low level & edge triggered interrupts.
   i) What are contents of different important register after reset?
   j) Which ports of 8051 bit addressable?

Section-B

2. Explain the pin diagram of ADC 804 with respect to all pins working.
3. What are different addressing modes of 8051? Explain in detail about memory addressing modes also?
4. Write the syntax of ORL instructions for all modes.
5. Write a program to transfer the word "VIKAS" serially at 2400 baud rate, 8 bit data, and 1 stop bit. Make it working for infinite loop.
6. Write a program to create a square wave of T = 160ms on pin P2.2 while at the same time 8051 is sending out 55H and AAH to P1 continuously.

Section-C

7. (a) Write a program to
   (i) Write the values 55H to the RAM locations 40-4FH.
   (ii) Add all the values and save the results in RAM locations.
   (b) Write about CJNE instructions and all the flags affected by this instruction.
8. Show the connections of TXD & RXD of 8051 to DB-25 connections via MAX-233. Explain in detail then Explain MAX-233 individually.
9. Write a program in which every 2 seconds, the LED connected to P2 & is turned on and off four times, which at the same time 8051 is getting data from P1 and sending it to P0 continuously. Make sure the on and off states are 50ms in durations.

Roll No.....

Total No. of Questions : 09] [Total No. of Pages : 02

Paper ID [EC306]

 (Please fill this Paper ID in OMR Sheet)

MAY-08

B.Tech. (Sem.- 6th)

MICROCONTROLLERS & EMBEDDED SYSTEMS (EC-306)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What is the function of ALE signal in an 8051 microcontroller.

b) What are special function registers? Explain in brief.

c) Define an embedded processor.

d) What is auto-reload made of timer programming in 8051 microcontroller.

e) How many ways an 8051 microcontroller can be interrupted.

f) How 8051 microcontroller can be made do work in multiprocessor configuration.

g) What is co design? Explain with a flow-chart.

h) Explain the architectural differences between 8051 microcontroller and an ARM processor.

i) What are $\overline{PSEN}$ and $\overline{EA}$ signals of 8051 do?

j) What is the function of SMOD bit in 8051 μC.

Section - B

(4 × 5 = 20)

Q2) Explain the differences between a microprocessor and a microcontroller.

Q3) Write a program using 8051 μC do generate a square wave of 10 kHz.

Q4) Explain with the help of a flow chart the complete life cycle for a product development.

Q5) Write a program using 8051 microcontroller to interface 8051 microcontroller with an 8-bit flash A to D converter.

Q6) Draw the schematic to interface an 8051 μC With 16 K of ROM and 8K of RAM. You are availble with 4K chips of both ROM & RAM.

Section - C

(2 × 10 = 20)

Q7) Write a program using 8051 microcontroller to interface a 2 line x 20 characters. Also write a program sequence to display "HELLO THERE" on the LCD.

Q8) Write a program using 8051 μC to generate two square waves of 12 kHz. and 1 kHz simultaneously using interrupts.

Q9) Write short notes on the following:-

a) Hardware/software partitioning

b) ARM processor architecture.

Roll No. .....

Total No. of Questions : 09] [Total No. of Pages : 02

B.Tech. (Sem. - 6th)

MICRO CONTROLLER AND EMBEDDED SYSTEMS

SUBJECT CODE : EC -306

Paper ID : [A0319]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What is the size of internal RAM in 8051 microcontroller.
b) What do you mean by SCON in microcontroller 8051?
c) What do you mean by RS1 Bit in PSW register in microcontroller 8051?
d) Write the instruction to move value 34H into registers R5 and R6.
e) What is operation of instruction ADD A, # n?
f) What do you mean by bit jump?
g) Write the instruction to determine if R5 contains value 0; if so put 60H in it.
h) When is the T1 flag bit raised?
i) What is the difference between V_{CC} and V_{EE} pins on the LCD?
j) What is the difference between the MOVX and MOVC instructions?

Section - B

(4 × 5 = 20)

Q2) Explain the rotate and swap operation in microcontroller 8051.

Q3) Explain the function of following instructions :

(a) MOVA, address.
(b) PUSH address.
(c) XCH A, Rr.
(d) ANL C, B.
(e) SETB C.

Q4) Write a program to clear 16 RAM locations starting at RAM address 06H.

Q5) For XTAL = 11.0592 MHz, find the TH1 value (in both decimal and Hex) for each of the following baud rates.

(a) 9600
(b) 4800
(c) 1200
(d) 300
(e) 150

Q6) Write a program to create a square wave of 50% duty cycle on bit 1 of port 1.

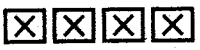
Section - C

(2 × 10 = 20)

Q7) Assume that a 1-Hz frequency pulse is connected to input pin 3.4. Write a program display counter 0 on an LCD. Set the initial value of TH0 to -60.

Q8) Show the microcontroller 8051 connection to the stepper motor and explain it. Also write code program to rotate it continuously.

Q9) What is embedded system? Explain the various parameters of an embedded system and its significance. Also, explain the embedded system design life cycles.



Roll No. .....

Total No. of Questions : 09] [Total No. of Pages : 02

B.Tech. (Sem. - 6th)

MICRO CONTROLLER AND EMBEDDED SYSTEMS

SUBJECT CODE : EC - 306

Paper ID : [A0319]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 x 2 = 20)*

a) What are the major differences between a microprocessor and microcontroller?

b) List the on chip timers in Microcontroller 8051.

c) Write the instruction to add the values 16H and CDH and place the result in register R2.

d) How many bytes of on-chip ROM are there in Microcontroller 8051?

e) What is the operation of instruction INC destination?

f) Which is operation of instruction MUL AB?

g) Write the instruction to clear the accumulator.

h) Which timer is used for baud rate programming in the microcontroller 8051?

i) What is "Clear LCD" and write its value is Hex?

j) Indicate when RD and WR are used in microcontrollers. Can these be used for accessing external memory?

Section - B

(4 x 5 = 20)

Q2) The following shows the crystal frequency for different 8051 microcontroller based systems. Find the period of the machine cycle in each case : 11.0592 MHz, 12 MHz, 16 MHz, 18 MHz and 20 MHz.

Q3) Explain in detail the timer mode control register (TMON).

Q4) Write a program to copy a block of 10 bytes of data from RAM locations starting at 35 H to RAM location starting at 60 H.

Q5) Find the baud rate for the following if XTAL = 16 MHz and SMOD = 0

(a) MOV TH1, #-10 (b) MOV TH1, #-25

(c) MOV TH1, #-200 (d) MOV TH1, #-180.

Q6) For a 16 x 2 LCD, the location of the last character of line 1 is 8F H (its command code). How this value is calculated explain?

Section - C

(2 x 10 = 20)

Q7) What are various addressing modes in microcontroller 8051? Explain them with suitable examples.

Q8) Assume that the microcontroller 8051 serial port is connected to the COM port of the IBM PC and on the PC we are using the terminal.exe program to send and receive data serially. P1 and P2 of the 8051 are connected to LEDs and switches, respectively. Write an 8051 program to

(a) send to the PC the message "We are ready".

(b) receive any data sent by the PC and put it on LEDs connected to P1, and

(c) get data on the switches connected to P2 and send it to the PC serially.

The program should perform part

(a) once but parts (b) and. (c) continuously.

Use the 4800 baud rate.

Q9) Give an introduction to latest microcontrollers and list their applications explaining any one of them.