GANPAT UNIVERSITY
B.TECH. SEM VI MECHATTRONICS ENGINEERING
CBCS REGULAR EXAMINATION April - June 2015
2MC604 - MICROCONTROLLER

Time : 3 Hours **Total Marks : 70**

Instructions:

1). All questions are **compulsory**.
2). Figures to the **right** indicate full marks.
3). Answers to the two sections must be written in **separate** answer books.
4). Assume suitable date if **necessary**.
5). Assume system frequency **11.0592** MHz.

SECTION – I

Q-1). Attempt All. [12]

[A] Write two different programs to transfer data contained in registers R4 to R7 of register bank 1 to R0 to R3 of register bank 3 respectively using following two methods.
(i) PUSH & POP (ii) XCH

[B] Program timer 1 to be an event counter. Use mode 1 and display the binary count On P2 & P3 ports continuously. Set the initial count to 20000.

OR

Q-1). Attempt all. [12]

[A] Write a program to find the odd and even numbers from ten numbers which are stored from memory locations 40H & onwards. Store the odd and even numbers on external RAM locations 0100H & 0101H respectively.

[B] Write a program to transfer the message "MICRO" serially at 9600 baud, 8 bit data, 1 stop bit continuously.

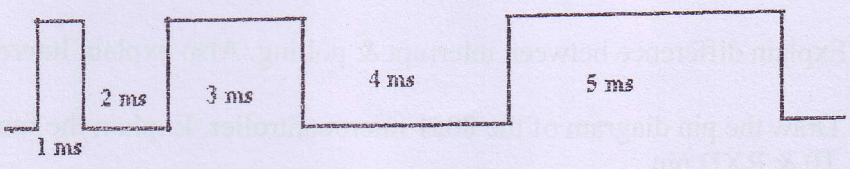
Q-2). Attempt all.

[A] (i) Write a program to add BCD 254916H to 836593H and save the BCD result in RAM memory locations starting at 55H. [03]

(ii) Find the time delay for the following subroutine, assuming a crystal frequency of 16 MHz. [02]

		Machine Cycle
	MOV R1 , #50	1
AGAIN:	MOV R5 , #30	1
HERE:	NOP	1
	NOP	1
	DJNZ R5 , HERE	2
	DJNZ R1 , HERE	2
	RET	1

[B] Generate the following waveform on P1.0.use timer 0 in mode 2. [06]



[P.T.O]

OR

Q-2). Attempt all.

[A] The below given data are stored in internal RAM locations starting from 50H. Store The first two memory locations which contains consecutive numbers in RAM locations 20H & 21H. [05]

DATA: 25H, 67H, 34H, 19H, 1AH, 7CH, 5FH, 84H, 85H & 9BH

[B] (i) Store the contents of RAM location 40H at the address contained in RAM location 18H. [03]

(ii) Write a program to copy a block of 10 bytes of data from RAM locations starting at 35H to RAM locations starting at 60H. [03]

Q-3). Attempt all. [12]

[A] Swap the bit 0 & 1, 2 & 3, 4 & 5, 6 & 7 of register R5.

[B] (i) Find register A contents after each of the following is executed.

```
MOV A, # 56H
SWAP A
RR A
RL A
SWAP A
```

(ii) The following are bit addresses. Indicate where each one belongs.
(a) 67H (b) 85H

[C] Convert the hex number stored in 55H memory location to decimal number and stored in Ports P0, P1 & P2.

SECTION - II

Q-4). Attempt all. [12]

[A] Draw and explain SCON and PCON registers of 8051.

[B] How the pulses are given when the timer is used as a counter?

[C] Explain difference between SWAP & XCH instruction with example.

OR

Q-4). Attempt all. [12]

[A] (i) Explain PSW register.
(ii) Explain MUL instruction.

[B] What is a direct addressing mode in 8051? Discuss advantages of this mode.

[C] When the OV flag set? Explain with examples.

Q-5). Attempt all.

[A] Explain difference between interrupt & polling. Also explain Interrupt service routine. [05]

[B] Draw the pin diagram of the 8051 microcontroller. Explain the function of EA, ALE, T0 & RXD pin. [06]

[P.T.O]

OR

Q-5). Attempt all.

[A] Write short note on LCD interfacing with the 8051 with necessary diagram. [03]

[B] Explain the internal RAM organization of 8051 microcontroller. [02]

[C] How Port0 pins serves as inputs, outputs or as a bidirectional low-order address and data bus (AD0 to AD7)? Explain with necessary diagram. [06]

Q-6). Attempt all. [12]

[A] Explain IE & IP registers.

[B] Why do we need serial communication port in 8051? Explain different methods for the serial communication process.

[C] (i) Show how the 8051 would represent -34H.
(ii) Difference between LJMP & SJMP instruction
(iii) 67H in BCD when converted to ASCII is _____H & _____H.
(iv) Write down all interrupts according to their priority level.

END OF PAPER