

Instruction : (1) All Questions are **compulsory**.

(2) Illustrate your answers with neat sketches **wherever** necessary.

(3) Figures to the **right** indicate **full** marks.

(4) **Assume** suitable data, if necessary.

(5) **Use** of Non-programmable Electronic Pocket Calculator is **permissible**.

1. (a) Attempt any **THREE** of the following: / [12]
- (i) Distinguish between Microprocessor and Microcontroller (any four points).
 - (ii) Draw neat labelled block diagram of Von-neumann and Harvard architecture.
 - (iii) Describe power saving options of 8051 microcontroller
 - (iv) State the function of :
 - (1) Editor (2) Assembler (3) Compiler (4) Linker
 - (v) With control word register, explain Bit Set reset (BSR) mode of 8255
- (b) Attempt any **ONE** of the following : [6]
- (i) Write an assembly language program for 8051 microcontroller for finding the largest number in a given set of 05 number (Assume suitable data/memory addresses)
 - (ii) Draw a diagram to interface 4K byte EPROM and 4K Byte RAM to 8051 microcontroller. Draw the memory map.
2. Attempt any **FOUR** of the following : [16]
- (a) Draw the internal RAM organization of 8051 with the address location.
 - (b) Compare 8031, 8051 and 8751 (four points)
 - (c) Write an assembly language program to add two BCD numbers 66H and 95 H which are stored at external memory location 3000 H and 3001 H respectively. Store the result at memory location 3002 H.
 - (d) Draw the format of PSW register of 8051 μ C and state the function of each flag.
 - (e) The bit addressable feature in 8051 microcontroller makes it more powerful than microprocessor, justify your answer.
 - (f) State and describe the alternate functions of port 3 pins of 8051.
3. Attempt any **FOUR** of the following : [16]
- (a) Explain the following directives with example.
 - (i) ORG (ii) DB (iii) EQU (iv) END
 - (b) Draw the software development cycle. State the function of editor, assembler and cross compiler.
 - (c) Describe the function of following instruction of 8051 microcontroller.
 - (i) RLC A (ii) XRL A, 15h
 - (iii) DIV A B (iv) MOVX @ DPTR, A
 - (d) State the function of compiler, linker, assembler and editor in S/W development.
 - (e) Write an ALP for 8051 microcontroller to multiply two 8-bit numbers 23H and 15H. (Assume suitable memory addresses to store the result)
4. (a) Attempt any **THREE** of the following: [12]
- (i) Write an ALP to calculate the sum of five consecutive numbers stored from memory location starting at 20 H. Store the lower byte at memory location 25 H and higher byte at 26 H.
 - (ii) Explain the following addressing modes with the help of ADD instruction in

- (1) Direct addressing mode (2) Indirect addressing mode
 (3) Register addressing mode (4) Immediate addressing mode
 (iii) With the help of neat diagram, describe the timer modes of 8051 μ C.
 (iv) Explain the four operating modes of serial communication of 8051 microcontroller.
- (b) Attempt any **ONE** of the following : [6]
- (i) Write an assembly language program to send message "HELLO" serially at 4800 band rate continuously (Crystal frequency = 11.0592 MHz)
 (ii) Draw the interfacing diagram of 8 LEDs to port 2 of 8051 microcontroller. Write an ALP to turn these LEDs ON and OFF after a certain delay.
 (iii) Draw the interfacing diagram of stepper motor with 8051 microcontroller. Write an ALP to motor continuously in clockwise direction.
5. Attempt any **FOUR** of the following : [16]
- (a) List the interrupts used in 8051. Give their priorities and addresses.
 (b) Write a program to generate a square wave of 50% duty cycle on P1. 5 bit. Timer 0 is used to generate the time delay.
 (c) Draw the format of IP register of 8051 microcontroller. Describe the function of each bit in it.
 (d) Write an ALP for 8051 microcontroller to generate square wave on port pin P2.1 using delay subroutine.
 (e) Draw the circuit diagram of port 2 and describe its function.
6. Attempt any **FOUR** of the following : [16]
- (a) Draw the format of TCON register and describe the function of each bit.
 (b) Draw the format of IE register of μ c 8051 and describe function of each bit in it.
 (c) Draw the block diagram of IC 8255 and describe its operating mode.
 (d) Draw format of SFR SCON and explain each bit of same.
 (e) Describe selection factors of microcontroller.



T Y Diploma Sem-V: Paper Discussion Schedule

Branches	Date	Day	Timing	Centres
Electronics Group	8 Nov. 2018	Thursday	9 a.m. to 11 a.m.	Dadar
	8 Nov. 2018	Thursday	12 noon to 2 p.m.	Thane