TED (15) - 6032
(Revision - 2015)

Reg. No.....
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MC . 1

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/COMMERCIAL PRACTICE

MICROCONTROLLER AND PROGRAMMABLE LOGIC CONTROLLERS

Model

[Time: 3 hours]

(Maximum marks: 100)

PART-A
(Maximum marks: 10)

I. Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Write any four Features of 8051
2. Identify any four special function registers.
3. Write instructions for multiplication and division in proper syntax.
4. Define serial communication.
5. Draw a simple ladder diagram and show rail and rung, 5x2= 10 marks

PART-B
(Maximum marks: 30)

Answer *any five questions*. Each question carries 6 marks.

II.

1. Explain PSW register in 8051.
2. Illustrate the different modes of operation of timers in 8051.
3. Explain the various bit level logical operations in 8051.
4. Write a delay subroutine using registers or using timer 0 in mode1 to provide 100 micro second time delay. Clock frequecy is 12 mHz.
5. Write any six features of PIC 18 microcontroller
6. Explain the process of serial communication in 8051.
7. Status of eight sensors are saved in the external RAM 8400h onwards. Prepare the ALP to bring these data in to stack memory of 8051. 5x6=30 marks

PART—C
(Maximum marks: 60)

(Answer any one full question from each module. Each full question carries 15 marks.)

Module - I

III.

a) Explain the functions of essential blokes in the block diagram of 8051.

8 marks

b) Give the pin details of of 89C51. 7 marks

OR

IV.

a) Discuss why the interrupts are required in automated system controllers.

8 marks.

b) Explain the architecture of 8051, 40 pin DIP, with a neat sketch. 7 marks

Module- II

V.

a) Write an assembly language program to to find the largest of the array of 'n' numbers . 8 marks

b) Discuss the different situations where direct and indexed addressing modes are useful. 7 marks.

OR

VI.

a) Explain the various program control instructions in 8051 with examples.

8 marks

b) Examine the register contents after executing the following instructions.

```
mov a, #25h
clr c
mov r0,a
add a,r0
rlc a
rl a
swap a
```

7 marks

Module- III

VII.

a) Explain programming of 8255. 8 marks

b) Construct architecture of the AVR microcontroller. 7 marks

OR

VIII.

a) A four phase,5V, 550mA stepper motor is to be controlled by 8051 chip through a suitable driver. Prepare the circuit diagram. 8 marks

b) A small industry consists of 12 dc motors interlocked each other so as to ensure tripping of all during fault. List the important features of AVR micro controller which can be used in such control schemes. 7 marks

Module- IV

IX.

a) Write a ladder program to realize traffic control scheme as per the following requirement;

Indicator lamps	Phase1	Phase 2 (time delay)	Phase 3	Phase 4 (time delay)	Phase 5	Phase 6 (time delay)
red	on		off		off	
green (pedestrians)	on		off		off	
yellow	off	120 seconds	on	60seconds	on	240 seconds
red (pedestrians)	off		on		on	
green	off		off		on	

Repeat phase 1 after phase 6. 8 marks

b) Draw the symbols of the following used in ladder programming.

1. Normally open contact
2. Normally closed contact.
3. Output relay coil
4. On delay timer

7 marks

OR

X.

a) Explain different timers available in a standard PLC 8 marks

b) In a chemical industry, a PLC is employed in pH control section of effluent water. Two on/off switches, two analog sensors and four relays are connected to the PLC. Discuss the working of PLC in general with a neat internal block diagram of PLC. 7 marks