

TED (15) – 6032

(REVISION — 2015)

Reg. No. **MC. 2**

Signature

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

**MICROCONTROLLER AND PROGRAMMABLE LOGIC
CONTROLLERS**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. State the capacity of internal RAM in 8051 Microcontroller.
2. Name the two registers associated with interrupt handling.
3. Write the syntax of the instruction used to perform division operation in 8051 Microcontroller.
4. List any two features of PIC 18 Micro controller.
5. Draw a ladder diagram with single input and single output and mark rail and rung on it.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. State any six features of 8051 Microcontroller.
2. Explain PSW register of 8051 and show its contents.
3. Explain with examples any two addressing modes in 8051.
4. Distinguish between XCH and XCHD instructions in 8051.
5. Write any four features of AVR microcontroller.
6. List any six factors considered for selecting a PLC for industrial process control.
7. Justify the importance of PLC for its application in automation.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Construct the general block diagram of 8051 microcontroller and explain each blocks. 8
- (b) Define interrupts in 8051 Micro controller. List the five interrupts in 8051 Microcontroller and identify their normal priorities. 7

OR

- IV (a) Draw the pin out diagram of 8051 microcontroller. 8
- (b) Explain the purpose of following pins of 8051. 7
- (i) Port 3 Pins (P 3.0 - P 3.7)
- (ii) XTAL 1 & XTAL 2.
- (iii) ALE

UNIT — II

- V (a) Identify the content of various registers after the execution of following instructions. 8
- MOV A,#0B4h
 RRA
 SWAP A
 CLR C
 RRC A
 RRC A
 RL A
 CPL A
- (b) Distinguish between the bit level and byte level logical AND operations in 8051 microcontroller. 7

OR

- VI (a) Explain the role of SP and two instructions used for stack operation in 8051. 8
- (b) A group of 8 LEDs are connected to port 1 of 8051 microcontroller. Write an assembly language program to turn on and off the alternate LEDs repeatedly 10 times with a proper delay. 7

UNIT — III

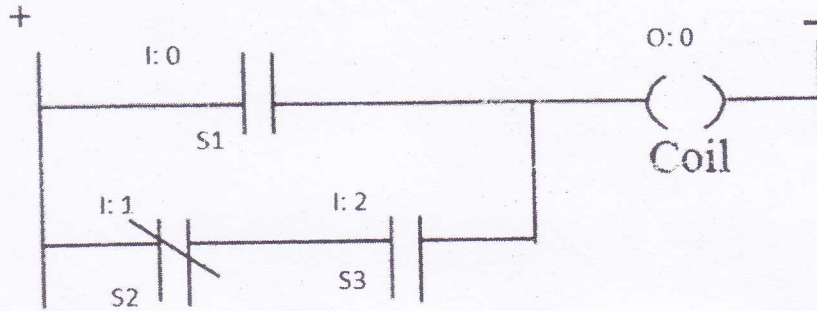
- VII (a) Draw the block diagram of 8255 programmable peripheral interface. 8
- (b) Construct the architecture of AVR microcontroller. 7

OR

- VIII (a) Draw the circuit diagram to interface a stepper motor with 8051 microcontroller. 8
- (b) Explain the control word register of 8255 programmable peripheral interface. 7

UNIT — IV

- IX (a) Three switches are connected to the inputs of the PLC. A lamp is connected at the output. Predict the output of the following ladder program for the given conditions.



CONDITIONS	SWITCH STATUS			LAMP STATUS
	S1	S2	S3	L
1	OFF	OFF	ON	
2	OFF	ON	ON	
3	OFF	OFF	ON	
4	ON	OFF	ON	

- (b) Draw block diagram of PLC and explain.

OR

- X (a) Compare a PLC based panel system with a conventional relay panel system.
- (b) Develop a ladder program to realize a star delta starter for a 3 phase induction motor.