TED (15) – 6032

(REVISION — 2015)

Reg. No. .....

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 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.

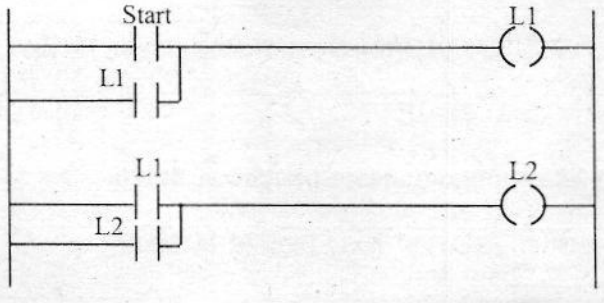
1. Specify the default stack location in 8051 microcontroller.
2. Mention any two addressing modes in 8051.
3. Define asynchronous serial communication.
4. Specify the register which is dedicated for setting serial communication modes.
5. Identify any two applications of PLC. (5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Mention any six features of 8051 micro controller.
2. Clarify the functions of 8051 timers in mode 1, mode 2 and mode 3.
3. Compare ANL and ORL 8051 instructions with suitable examples.
4. The R0 register is loaded with the data 0FFh. Write a subroutine in which R0 is decremented to zero to generate time delay.
5. Draw the block diagram of AVR microcontroller.
6. Construct block diagram of PLC.
7. Interpret the control logic of following ladder program.



(5 × 6 = 30)

Marks

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Sketch the architecture of 8051. 8

(b) Mention the role of pins 9, 10, 11, 18, 19, 20 and 40 of 8051 chip. 7

OR

IV (a) Sketch the pin configuration of 8051 microcontroller. 8

(b) Define interrupts in 8051 and clarify the role of IE and IP registers. 7

UNIT — II

V (a) Write an assembly language program to sort the biggest of five, 8 bit numbers stored in internal data memory starting from 08h and save the result in the external memory location 8500h. 8

(b) Identify the addressing modes in each instructions.

```
mov a,#34h
mov a,33h
mov a,r0
mov a,@r0
movx a, a+@dptr
mov a,@dptr
mov 33h,34h
```

7

OR

VI (a) The hex data 3Fh is stored in the memory location 8200h. Write the content of accumulator, carry flag, dptr after executing the following instructions.

```
setb c
mov dptr, #8200h
movx a, @dptr
addc a,#08h
rl a
mov r0,a
```

8

(b) Differentiate ljmp and sjmp instructions of 8051 in view of jumping range. 7

UNIT — III

VII (a) Sketch the block diagram of 8255 programmable peripheral interface. 8

(b) Explain the role of SBUF register, TxD and RxD pins of 8051. 7

OR

Marks

VIII (a) Draw a schematic diagram to interface a 12V, 5A solid state relay to 8051 microcontroller. Show basic power supply and crystal oscillator connections. 8

(b) Explain the features of AVR microcontroller. 7

UNIT — IV

IX (a) Two motors (M1 and M2) are connected to PLC. Develop a ladder program to energize M1, when pressing a push button and energize M2 after 60 seconds. 8

(b) Identify the advantages of PLC panel compared with a relay panel. 7

OR

X (a) Write a ladder program to realize DOL starting of a three phase induction motor. ON button: push to on, OFF button: push to on. Provide over load trip. 8

(b) Explain how PLC manages, the program, the input and output units to realize desired control logic. 7