

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019 – 20 Examination

Semester: 5

Subject Code: 03106301

Subject Name: Microcontroller and Its Applications

Date: 07/12/2019

Time: 10:30 am to 01:00pm

Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark)**(15)**

1. $(1714)_{10} = (\text{_____})_{16}$
2. For an 8051 system of 11.0592 MHz, To execute the instruction "MUL AB" will take _____ μs .
3. The LCALL instruction is a _____ byte instruction.
4. _____ port in 8051 microcontroller is connected to external pull up resistors to configure as an I/O port.
5. In the interrupt vector table, the address assigned to Timer 0 is _____.
6. How many address lines are required for accessing the data in the memory chip of 512 bytes RAM?
7. How the baud rate in 8051 microcontroller can be doubled?
8. How many interrupts are available to user in 8051 microcontroller?
9. If the crystal frequency is 22 MHz, what will be the baud rate if $TH1 = -3$ with $SMOD = 0$.
10. When is the overflow flag (OV) is set in 8051 microcontroller?
11. The period of the machine cycle is _____, if the crystal oscillator frequency is 20 MHz.
 (a) $1.085 \mu s$ (b) $0.75 \mu s$
 (c) $0.5 \mu s$ (d) $0.6 \mu s$
12. What is the address range of SFR register Bank?
 (a) 00-77 H (b) 40-80 H
 (c) 80-7F H (d) 80-FF H
13. The 16-bit address bus allows to access an address range of:
 (a) 0000 to FFFFH (b) 000 to FFFH
 (c) 00 to FFH (d) 0 to FH
14. Which of the following instructions will load the value 45H into the high byte of timer 1?
 (a) MOV TH1,45H (b) MOV T1,#45H
 (c) MOV T1,45H (d) MOV TH1,#45H
15. The ROM memory address of the 8051 chip DS5000-32 with 32KB is _____.
 (a) 0000-FFFF H (b) 000-FFF H
 (c) 0000-7FFF H (d) None of above

Q.2 Answer the following questions. (Attempt any **three**) **(15)**

A) Draw the pin diagram of 8051 microcontrollers. Explain the function of RST, EA/Vpp and PSEN pins.

B) Explain simplex, half duplex and full duplex serial transmission.

C) Discuss bit pattern and significance of each bit of TCON and TMOD registers of 8051.

D) Explain various addressing modes of 8051 Instructions with suitable example.

Q.3 A) List the default interrupts priority. Explain IP and IE registers of 8051 microcontroller. **(07)**

B) Write an ALP to transfer a block of 10 data bytes, stored in internal RAM starting at location 20h and to the destination location starting at 30h. **(08)**

OR

B) Write an assembly language program to toggle all the bits of port P2 continuously with a delay of 30ms. Crystal oscillator frequency is 11.0592 MHz. **(08)**

Q.4 A) Explain the interfacing of multiple 7-segment display. **(07)**

OR

A) Write a C program to generate a square wave of 50Hz at pin P2.1 using timer's concept. Assume crystal oscillator frequency is 11.0592 MHz. **(07)**

B) Draw and explain memory mapping of 8051 microcontroller in brief with clearly mentioning the all necessary details. **(08)**