B.TECH/EE/6TH SEM/ELEC 3204(BACKLOG)/2021

MICROPROCESSOR & MICROCONTROLLER
(ELEC 3204)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) The clock speed of 8085 μP is
(a) 8MHz (b) 3.125MHz
(c) 2.5MHz (d) 10MHz

(ii) Name of the 16 bit register(s) in 8085 is/are
(a) Stack pointer (b) Program counter
(c) Accumulator (d) both (a) and (b)

(iii) Which one is the call location of RST7.5 interrupt?
(a) $003C^H$ (b) 0036^H
(c) 0034^H (d) 0024^H

(iv) In Intel 8085 μP ALE signal is made high to
(a) Fetch the instruction
(b) Increment the program counter
(c) Enable the data bus to be used as higher order address bus
(d) Enable the data bus to be used as low order address bus

(v) Which interrupt will be enabled after execution of the following instructions in Intel 8085 microprocessor
MVI A, $0E^H$
SIM
(a) RST5.5 (b) RST6.5
(c) RST7.5 (d) All of these

(vi) The program counter in a 8085 μP is a 16 bit register because
(a) it counts 16 bits at a time
(b) There are 16 address lines
(c) It has to fetch two 8 bit data at a time
(d) It facilitates the user storing 16 bit data temporarily

(vii) Which of the following instructions will copy the contents of RAM whose address is in register R0 to port 3?
(a) MOV P3, @R0 (b) MOV@P3, R0
(c) MOV @R0, P3 (d) MOV P3, R0

(viii) The register(s) that provides control and status information about counter in 8051 microcontroller is
(a) TCON & TMOD (b) SCON
(c) IP (d) IE

(ix) Which interrupt has the highest priority in 8051 microcontroller on 'power on reset'?
(a) Timer interrupt 0 (b) External interrupt 0
(c) External interrupt 1 (d) Timer interrupt 1

(x) After power on reset, all port latches contain
(a) FF^H (b) 00^H (c) 07^H (d) 20^H

Group – B

2. (a) How long would the Intel 8085 microprocessor take to execute MOV A,B if a 5 MHz crystal is connected with it?

(b) Explain the function of the following pins related to INTEL 8085 microprocessor:
(i) SID, (ii) SOD , (iii) IO/$\overline{M}$, (iv) ALE.

(c) Interface a 16KB EPROM IC with the 8085 using a NAND gate address decoder such that the starting address assigned to the chip is $C000^H$.

3 + 4 + 5 = 12

3. (a) Illustrate following instructions in Intel 8085 microprocessor: RAL and RLC.

(b) Write an Assembly Language Program to obtain the largest number from a set of ten 8-bit numbers which are stored in ten consecutive memory locations starting from $F200^H$. The largest number is to be stored in $F300^H$.

(c) Develop a delay subroutine for delay time 1.8 ms in a 2 MHz microcomputer system. Show the proper calculations.

2 + 5 + 5 = 12

Group – C

4. (a) Write a 8085 based assembly language program to multiply two hexadecimal numbers 26^H and 18^H and store the result in memory locations $FFF8^H$ (Higher byte) and $FFF7^H$ (Lower byte).

(b) Write a BSR control word subroutine to set bits PC5 and PC3 of 8255 and reset them after 30ms. Assume that 30 ms delay subroutine is available and address of 8255 CWR is 83H.

6 + 6 = 12

5. (a) Explain the following software instructions EI and DI.

   (b) Draw the circuit diagram that outputs RST 1 instruction opcode(CF^H) on acknowledging the interrupt and explain the same.

   (c) Discuss a brief comparison between I/O mapped I/O and Memory mapped I/O.

4 + 4 + 4 = 12

Group – D

6. (a) Write down the features of 8051 microcontroller.

   (b) Draw the bit pattern of PSW register of 8051 microcontroller and explain the function of each bit.

   (c) Explain the role of the following pins of 8051 µC:
   (i) $\overline{PSEN}$, (ii) $\overline{EA}$.

4 + 4 + 4 = 12

7. (a) Explain the following 8051 µC instructions:
   (i) DA A
   (ii) SJMP rel-addr
   (iii) MOV A, @R1.

   (b) Describe TCON and TMOD registers of 8051 microcontroller.

(2 + 2 + 2) + (3 + 3) = 12

Group – E

8. (a) Draw and describe the interfacing connection of ADC0804 with 8051 microcontroller.

   (b) Write an Assembly Language Program to read analog input and store the converted digital output in accumulator.

(3 + 3) + 6 = 12

9. (a) Draw the interfacing circuit of 8051 microcontroller with 16×2 LCD and explain properly.

   (b) Write an Assembly Language Program to display 'SOLUTION' in the LCD of above circuit.

(3 + 3) + 6 = 12

Department & Section	Submission Link
EE	https://classroom.google.com/c/MjI2MjE5NDQ2MDMy/a/MzY0MzE0Njc3MzAy/details