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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**(An Autonomous Institute Affiliated to AKTU, Lucknow)****B.Tech****SEM: IV - THEORY EXAMINATION (2022-2023)****Subject: Microprocessor and Microcontroller****Time: 3 Hours****Max. Marks: 100****General Instructions:****IMP:** Verify that you have received the question paper with the correct course, code, branch etc.**1.** This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.**2.** Maximum marks for each question are indicated on right -hand side of each question.**3.** Illustrate your answers with neat sketches wherever necessary.**4.** Assume suitable data if necessary.**5.** Preferably, write the answers in sequential order.**6.** No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.**SECTION A****20****1. Attempt all parts:-**

- 1-a. How many data lines and address lines are available in 8085? (CO1) 1
- (a) 4,8
(b) 8,16
(c) 8,8
(d) 16,32
- 1-b. Which functional component of the computer system is responsible for the computing? (CO1) 1
- (a) RAM
(b) CPU
(c) Input
(d) ROM
- 1-c. The length of stack pointer is of _____ bits. (CO2) 1
- (a) 4
(b) 8

- (c) 16
(d) 32
- 1-d. The number of output pins in 8085 microprocessors are _____. (CO2) 1
(a) 27
(b) 40
(c) 21
(d) 19
- 1-e. Which of the following instructions will load the value 35H into the high byte of timer 0? (CO3) 1
(a) MOV TH0, #35H
(b) MOV TH0, 35H
(c) MOV T0, #35H
(d) MOV T0, 35H
- 1-f. 8051 series has how many 16 bit registers? (CO3) 1
(a) 2
(b) 4
(c) 6
(d) 8
- 1-g. What is the full form of LPAE? (CO4) 1
(a) Large Page Address Extensions
(b) Large Page Automatic Extensions
(c) Large Page ARM Extensions
(d) None of these
- 1-h. When clock frequency goes up in a microprocessor the dynamic power _____. (CO4) 1
(a) increases
(b) decreases
(c) becomes 0
(d) don't change
- 1-i. ISB, DSB and DMB are _____ instructions. (CO5) 1
(a) arithmetic
(b) Memory synchronization
(c) Logical

(d) None of these

- 1-j. Which one of the following is NOT 16-bit Thumb instructions supported on the Cortex-M0 processor? (CO5) 1
- (a) BL
 - (b) SBC
 - (c) ORR
 - (d) STRB

2. Attempt all parts:-

- 2.a. Mention the differences between 4004 and 8085 microprocessors. (CO1) 2
- 2.b. What is Non-Maskable interrupts? (CO2) 2
- 2.c. Write a short note on register indirect addressing mode of 8051. (CO3) 2
- 2.d. What do you mean by multiprocessor environment in reference to ARM Cortex M0? (CO4) 2
- 2.e. Discuss any two rotate instructions of Cortex-M0 processor. (CO5) 2

SECTION B

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3. Answer any five of the following:-

- 3-a. Find the number of address lines used by memory devices given below: (CO1) 6
- i. 64Mb
 - ii. 32Kb
 - iii. 16GB
 - iv. 256KB
- 3-b. Explain the following parts of computer in detail. (CO1) 6
- a. CPU
 - b. Input & Output
 - c. Memory
- 3-c. Explain the following instructions of 8085 microprocessor with an example. (CO2) 6
- a) Arithmetic instructions
 - b) Machine control instructions
- 3-d. What is ALU? Explain general purpose registers. (CO2) 6
- 3.e. Find the sum of values 7BH, A5H, F2H put the sum in R0 and R5 using instruction.(CO3) 6
- 3.f. What are the various kinds of timers available in ARM Cortex M0 microprocessor? Illustrate each of them. (CO4) 6

- 3.g. Explain arithmetic instructions available in ARM Cortex-M0 instruction set. (CO5) 6

SECTION C

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4. Answer any one of the following:-

- 4-a. What is System Bus? Draw its architecture and Explain the different types of Buses with their functions. (CO1) 10
- 4-b. Draw and explain the connections of memory to the CPU using four RAM chips and one ROM chip. (CO1) 10

5. Answer any one of the following:-

- 5-a. Explain the different addressing modes of 8085 with example. (CO2) 10
- 5-b. a) Define instruction. 10
b) Explain the instruction and data formats of 8085 μ P. (CO2)

6. Answer any one of the following:-

- 6-a. (i) Draw the data memory structure of 8051 microcontroller and explain how to access external memory devices. (CO3) 10
- 6-b. Explain the different addressing modes of 8051. Give an example for each one of them. (CO3) 10

7. Answer any one of the following:-

- 7-a. What is the need of Program Counter? How it helps in program execution in ARM Cortex M0 processor? (CO4) 10
- 7-b. How an ARM processor can be designed for security sensitive applications? Elaborate with an example. (CO4) 10

8. Answer any one of the following:-

- 8-a. Explain the following instructions with examples: (CO5) 10
(i) CPS (ii) LDRH (iii) RSB (iv) CMP
- 8-b. Explain the following instructions with examples: (CO5) 10
(i) MOVS (ii) ADDS (iii) LDRB (iv) STR