

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017**

**Course Code: EE309**

**Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS (EE)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

		Marks
1	Explain demultiplexing of Address/Data Bus.	(5)
2	Write a delay subroutine program in 8085 for 0.4 ms. Assume the clock frequency as 3 MHz.	(5)
3	Differentiate between maskable and non-maskable interrupts and list the interrupt related instructions.	(5)
4	Difference between Microprocessor and Microcontroller.	(5)
5	Write an ALP using 8051 to generate a square wave of 50% duty cycle.	(5)
6	Explain SFR's of 8051.	(5)
7	Explain Assembler Directives of 8051.	(5)
8	Explain the function of TMOD and TCON registers of 8051 Microcontroller.	(5)

**PART B**

*Answer any two full questions, each carries 10 marks.*

9	Explain the architecture of 8085 microprocessor with the help of a neat functional block diagram.	(10)
10	Draw and explain the timing diagram of LDAX D.	(10)
11	a) Explain different addressing modes in 8085 with examples.	(6)
	b) Explain the terms Machine cycle and T-states.	(4)

**PART C**

*Answer any two full questions, each carries 10 marks.*

12	a) Draw the interrupt structure of 8085.	(5)
	b) Design memory systems to interface 2K ROM and 2K RAM using 2K x 8 bit memory chips.	(5)
13	a) Give the current trends and challenges in the field of Embedded Systems.	(5)
	b) Describe the Embedded System product development model.	(5)
14	a) Explain Assembler, Compiler, Linker and Loader.	(5)
	b) Draw the block diagram of 8255.	(5)

**PART D**

*Answer any two full questions, each carries 10 marks.*

15	With neat block diagram, explain the architecture of 8051.	(10)
16	a) Explain the addressing modes of 8051 with examples.	(6)
	b) Explain how serial port programming is done in 8051.	(4)
17	Show how an LCD can be interfaced with 8051 and also write a program to send 'Y', 'E', 'S' to LCD continuously.	(10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018**

**Course Code: EE309**

**Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS (EE)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks*

- 1 With examples explain the addressing modes of 8085. (5)
- 2 Explain the PUSH and POP instructions of 8085 with example. (5)
- 3 How the interrupts of 8085 can be classified? (5)
- 4 Compare microprocessor and microcontroller. (5)
- 5 Explain PSW of 8051. (5)
- 6 Discuss about various Bit handling instructions of 8051. (5)
- 7 Draw the TMOD register of 8051. Indicate which mode and which timer are selected for each of the following (5)  
 i) MOV TMOD, #01H ii) MOV TMOD, #20H iii) MOV TMOD, #12H
- 8 Assume that bit P2.3 is an input and represents the condition of an oven. If it goes high, it means that the oven is hot. Monitor the bit continuously. Whenever it goes high, send a high-to-low pulse to port P1.5 to turn on a buzzer. (5)

**PART B**

*Answer any two full questions, each carries 10 marks.*

- 9 With a neat block diagram explain the internal architecture of 8085 microprocessor. (10)
- 10 a) Write a program to sort an array of 10 numbers in ascending order. (6)  
 b) Define instruction cycle and machine cycle. (4)
- 11 Draw and explain the timing diagram for the instruction MOV C, A (opcode: 4FH), stored in location 6000H. (10)

**PART C**

*Answer any two full questions, each carries 10 marks*

- 12 a) Draw the control word format for the I/O mode of 8255. (4)  
 b) Draw a neat circuit to interface 8 switches and 8 LEDs with 8085. Program port A (00H) as input and port B (01H) as output. Write a program to read continuously from port A and display at port B. (6)
- 13 a) Interface one 2Kx8 EPROM and 1Kx8 RAM. Use 3 to 8 decoder. Write the address range of each memory chip. (6)  
 b) What are the use of software tools for the development of an embedded system (4)
- 14 With a neat diagram explain water fall model. What are its disadvantages? (10)

**PART D**

*Answer any two full questions, each carries 10 marks*

- 15 a) Draw the detailed architecture of 8051 microcontroller. (6)  
 b) Explain the assembler directives of 8051. (4)
- 16 What are the different addressing modes of 8051 microcontroller? Explain each with suitable examples. (10)
- 17 Explain DAC interfacing with 8051 and write an ALP to generate a saw tooth waveform. (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018**

**Course Code: EE309**

**Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

- |   |   | Marks |
|---|---|-------|
| 1 | Explain the following pins in 8085 Microprocessor.<br>i) HOLD ii) READY iii) TRAP iv) ALE   | (5)   |
| 2 | Explain how delay is generated using one register and calculate how much delay can be generated if one register is loaded with maximum count. Assume time for one state is 320ns.                                 | (5)   |
| 3 | Explain the interrupts in 8085 Microprocessor.  | (5)   |
| 4 | Give comparison between Microprocessors and Microcontrollers.   | (5)   |
| 5 | Explain the following instructions used in 8051 microcontroller.<br>i) MOV R <sub>1</sub> , #05 <sub>H</sub> ii) ADD A, #01 <sub>H</sub> iii) MOV R <sub>2</sub> , 07 <sub>H</sub> iv) DJNZ R <sub>2</sub> , loop | (5)   |
| 6 | Explain with neat diagram the RAM of 8051.  | (5)   |
| 7 | Explain the Data types and Directives of 8051 Microcontroller.  | (5)   |
| 8 | Write a program to create a square wave of 50% duty cycle on the P1.5 bit .<br>Timer 0 is used to generate the time delay.  | (5)   |

**PART B**

*Answer any two full questions, each carries 10 marks.*

- |    |  |      |
|----|--|------|
| 9  | a) Write an ALP in 8085 to find the smallest number in an array                | (5)  |
|    | b) Draw the timing diagram for Memory Read operation.                          | (5)  |
| 10 | Explain with neat block diagram the architecture of Intel 8085 Microprocessor. | (10) |
| 11 | a) Explain CALL & RETURN instructions in 8085.                                 | (5)  |
|    | b) Explain Machine Cycle and Instruction Cycle                                 | (5)  |

**PART C**

*Answer any two full questions, each carries 10 marks.*

- |    |  |     |
|----|--|-----|
| 12 | a) Explain with suitable diagram, how an ADC can be interfaced with 8085 Microprocessor. | (6) |
|    | b) Explain Software and Hardware interrupts in 8085 Microprocessor.                      | (4) |

- 13 a) Draw an Interface circuit of 2048 x 8 bit RAM with 8085 using NAND Gate. (5)  
b) Explain general characteristics of Embedded system. (5)
- 14 a) Explain i) Compiler ii) Assembler iii) Linker iv) Loaders. (8)  
b) What are the demerits of Waterfall Model? (2)

**PART D**

*Answer any two full questions, each carries 10 marks.*

- 15 Explain with neat block diagram the architecture of 8051 Microcontroller. (10)
- 16 a) Explain SFR registers in 8051 microcontroller. (5)  
b) Explain TMOD and TCON registers of 8051 Microcontroller. (5)
- 17 Write an ALP in 8051 to add two 32 bit numbers & store the result. (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**Course Code: EE309**

**Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | The contents of accumulator and B-register are $2A_H$ and $AB_H$ respectively. Find the contents of A-register and flags after the execution of instruction ADD B. | (5) |
| 2 | Write a delay subroutine program in 8085 using one register. Find the maximum delay obtained under this condition. Assume time for one T state is 320ns.           | (5) |
| 3 | Explain different mode of operation of 8255.   | (5) |
| 4 | Differentiate between Assembler and Compiler.  | (5) |
| 5 | List out different bit handling instructions in 8051 and explain its operations.   | (5) |
| 6 | Explain the addressing modes of 8051 microcontroller with examples.  | (5) |
| 7 | Write an ALP in 8051 to add two 16 bit numbers.  | (5) |
| 8 | Explain assembler directives in 8051.  | (5) |

**PART B**

*Answer any two full questions, each carries 10 marks.*

- |    |  |      |
|----|--|------|
| 9  | Write an ALP in 8085 to convert Binary number to BCD number.                           | (10) |
| 10 | a) Explain machine cycle and T State in 8085.  | (5)  |
|    | b) Explain the significance of stack memory while executing CALL and RET instructions. | (5)  |
| 11 | a) Draw the timing diagram for the instruction INR M.                                  | (6)  |
|    | b) Explain the operation of the following instructions in 8085 (i)MOV A,M (ii)XCHG     | (4)  |

**PART C**

*Answer any two full questions, each carries 10 marks.*

- |    |  |      |
|----|--|------|
| 12 | Design a memory interface of 2K ROM and 4K RAM with 8085 using 2Kx8bit memory chips. | (10) |
| 13 | Explain the Life cycle management of embedded product development.                   | (10) |
| 14 | a) Draw the interrupt structure of 8085.   | (6)  |
|    | b) Differentiate between Microprocessor and Microcontroller                          | (4)  |

**PART D**

*Answer any two full questions, each carries 10 marks.*

- 15 Explain with neat block diagram the architecture of Intel 8051 microcontroller. (10)
- 16 Write an ALP in 8051 to create a square wave with ON time 3ms and OFF time 10ms, on all pins of port 0. Assume XTAL-11.05MHz. (10)
- 17 a) Explain different bit jump and byte jump instructions in 8051. (4)
- b) Explain SCON and SBUF registers in 8051. (6)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019**

**Course Code: EE309**

**Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

		Marks
1	Explain subroutine CALL and RET instructions in 8085	(5)
2	Explain the operation of following instructions (i) MVI C,05H (ii) INR H (iii) MOV A,B (iv) CMA	(5)
3	Explain briefly the control word in 8255 PPI.	(5)
4	Differentiate between hard & soft real time systems.	(5)
5	Write the 8-bit PSW register in 8051. Explain how register banks are selected using PSW register.	(5)
6	Explain I/O ports and its functions in 8051.	(5)
7	Write an ALP in 8051 to generate a square wave of 50% duty cycle on bit 0 of port 1 using Timer 0.	(5)
8	Find the values of TMOD registers to operate as timers in the following modes (i) Mode 1 Timer 1 (ii) Mode 2 Timer 0	(5)

**PART B**

*Answer any two full questions, each carries 10 marks.*

9	a) Explain addressing modes in 8085 with examples.	(6)
	b) Explain the function of following pins in 8085. (i) ALE (ii) TRAP	(4)
10	Draw the timing diagram of instruction STA 4500 <sub>H</sub> .	(10)
11	a) Write an ALP in 8085 to find the largest number from an array of numbers.	(6)
	b) Explain Fetch cycle & Execute cycle in 8085.	(4)

**PART C**

*Answer any two full questions, each carries 10 marks.*

12	a) Show how a DAC can be interfaced with 8085 Microprocessor.	(7)
	b) Explain software and hardware interrupts.	(3)
13	a) Differentiate between Microprocessor and Microcontroller.	(5)
	b) List the field of applications for an embedded system.	(5)

- 14 a) Explain with neat functional block diagram the operation in 8255 PPI (6)  
b) List out the challenges in Embedded Systems. (4)

**PART D**

*Answer any twofull questions, each carries 10 marks.*

- 15 Explain with neat diagram the Register organisation and SFR in 8051. (10)
- 16 Write an 8051 C program to toggle all the bits of P0 & P2 continuously with a 250ms delay. (10)
- 17 a) Write an ALP in 8051 to generate a square wave of 50% duty cycle on the P1.5 bit. Use Timer 0 to generate the time delay. (6)  
b) Explain the following instructions in 8051. (4)  
(i)MOV A,@R<sub>0</sub>(ii) JNB TF<sub>0</sub>, again

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth semester B.Tech degree examinations (S) September 2020

**Course Code: EE309****Course Name: MICROPROCESSOR AND EMBEDDED SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions, each carries 5 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | Differentiate between 1 byte, 2 byte and 3-byte instructions of 8085 with suitable examples        | (5) |
| 2 | Sketch the timing diagram of STA 4500  | (5) |
| 3 | Explain the Mode 1 operation of 8255   | (5) |
| 4 | Compare microprocessor and microcontroller   | (5) |
| 5 | List any five bit manipulation instructions of 8051  | (5) |
| 6 | Explain different addressing modes of 8051   | (5) |
| 7 | Explain the TMOD register of 8051  | (5) |
| 8 | Write an ALP in 8051 to divide two numbers and store the result in memory locations 4500 and 4501. | (5) |

**PART B***Answer any two full questions, each carries 10 marks.*

- |    |   |     |
|----|---|-----|
| 9  | a) Write an ALP in 8085 to sort an array of numbers in ascending order.   | (5) |
|    | b) Explain in detail the stack related operations in 8085   | (5) |
| 10 | a) Explain the instruction (i) LDAX Rp (ii) RAL   | (5) |
|    | b) Find the count to be loaded in a register pair to obtain a delay of 2500 $\mu$ s.<br>Assume clock frequency as 3 MHz | (5) |
| 11 | a) Draw the internal architecture of 8085   | (5) |
|    | b) Explain the various machine cycles of 8085   | (5) |

**PART C***Answer any two full questions, each carries 10 marks.*

- |    |   |     |
|----|---|-----|
| 12 | a) Illustrate the application of SIM instruction in 8085 microprocessor | (5) |
|    | b) List the challenges and current trends in embedded system design     | (5) |

- 13 a) Design an interfacing circuit for one 8K RAM and one 8K EPROM with 8085 microprocessor and find the memory address range (5)
- b) Explain compiler, assembler, linker and loader (5)
- 14 a) Explain the interfacing of DAC with 8085 and write a program to generate a saw tooth waveform continuously (8)
- b) What are the demerits of waterfall model (2)

**PART D**

*Answer any two full questions, each carries 10 marks.*

- 15 a) List the various registers of 8051 (5)
- b) Explain SCON register 8051 (5)
- 16 a) Differentiate between AJMP, LJMP and SJMP (3)
- b) Write a timer program to output a square pulse at 50% duty cycle through P3.1 (7)
- 17 a) Explain the port structure of 8051. (4)
- b) Write a program to serially output "A" at 9600 baud rate (6)

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