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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF INFORMATION SCIENCE

MAKEUP EXAMINATION – JULY 2024

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| **Semester :** III | **Date :4/7/24** |
| **Course Code :ECE1004** | **Time :9:30 AM TO 12:30 PM** |
| **Course Name :** Microprocessor Based System | **Max Marks :100** |
| **Program :** B. Tech 2020/2021 | **Weightage :50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 2M=10M** | | | |
| 1 | 8086 Microprocessor is an enhanced version of 8085 Microprocessor that was designed by Intel in 1976. It is a Microprocessor having \_\_\_\_\_\_\_\_\_\_address lines and \_\_\_\_\_\_\_\_\_\_\_data lines | (CO 1) | [Knowledge] |
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| 2 | The Flag register is a Special Purpose Register. Depending upon the value of result after any arithmetic and logical operation the flag bits would be set or reset. Draw the flag register of 8086 | (CO 2) | [Knowledge] |
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| 3 | Physical address refers to a memory address or the location of a memory cell in the main memory. The value of Code Segment (CS) Register is 4042H and the value of different offsets is as follows:  BX: 2025H , IP: 0580H , DI: 4247H  Calculate the effective address of the memory location pointed by the CS register | (CO 1) | [Comprehension] |
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| 4 | \_\_\_\_\_\_\_\_\_\_\_ provide sufficient current to the processor by boosting the signals & \_\_\_\_\_\_\_\_\_ are used to separate the data and address bus and store the addresses. | (CO 3) | [Knowledge] |
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| 5 | Microcontroller is like a set and the microprocessor is a subset of microcontroller. What is the substitute for instruction DJNZ in the 8051 microcontrollers? How is CJNE in 8051 different from CMP of 8086? | (CO 3) | [Knowledge] |
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| 6 | The number systems represent the different forms of numbers in digital system.Convert 3AF24H a hexadecimal number to binary number. | (CO 1) | [Comprehension] |
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| 7 | Many arithmetic operations are performed in digital system ,Addition is one of it.Perform the addition of following hexa numbers 45H & A87CH. | (CO 1) | [Comprehension] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | The registers are the storage spaces in microprocessors which hold the contents .What will be the contents of register BL after the last instruction execution?  MOV BL, 14H  MOV CL, 03H  ROL BL,CL. | (CO 2) | [Comprehension] |
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| 9 | The addressing mode is the way the operands are specified in the instruction. Report all addressing modes of the 8051 microcontrollers by giving two examples of each. | (CO2) | [Comprehension] |
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| 10 | Logical instructions are used in many applications, including bit manipulation, data encryption, and data compression. They are an important part of the instruction set of the 8086 microprocessor and are used extensively in assembly language programming. Write a program to Swap the upper and lower bytes of register using ROR instructions. | (CO3) | [Application] |
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| 11 | 8255 can be operated in three modes for port A namely MODE0, MODE1 and 2.State all the Modes for Port B and Form the Control Word in Hex for configuring the 8255 in simple I/O mode with the details of ports as indicated below:   |  | | --- | | Port CL = output | | Port CU = input | | Port B = output in Mode 0 | | Port A = input in Mode 1 . | | (CO4) | [Application] |
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| 12 | Shift and rotate instructions are used for various arithematic operations .Differentiate between SHR and ROR instructions of 8086. | (CO3) | [Comprehension] |
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| 13 | The size and meanings of the flag bits in a flag register are architecture dependent. It usually reflects the result of arithmetic operations as well as information about restrictions placed on the CPU operation at the current time.8086 has a flag register with 6 conditional flags and 3 control flags. Find the status of all these flags after the execution of the following instructions a) MOV AL, 47 H b)ADD AL, 0AH | (CO1) | [Comprehension] |
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| 14 | Consider you are assigned the task to call a Subroutione stored in code segment itself with starting address as 6000H for addition of two numbers and 7000H for division .Write an ALP for finding the average of three numbers 07h,09h and 0Ah using call instructions and above subroutines. | (CO3,CO4) | [Application] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M=40M** | | | |
| 14 | The memory chip for the 8086 microprocessor is divided into various segments such  as CS, DS, SS, and ES so that code and data can be stored separately. Given that the  DS contains 7FA2h and the offset address is 438Eh, then calculate the following  addresses giving an appropriate explanation for each.  1. Physical Address  2. Lower Range address in the Data Segment  3. Upper Range address in the Data Segment  4. Logical address | (CO1) | [Application] |
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| 15 | a) There is a total of seven addressing modes in 8086 microprocessor. Each addressing  mode is unique in the way the operands are specified in the instructions. Name the  type of addressing mode used in below instructions a) MOV [DI], AX b) MOV BX,  34E3H c) MOV [BX][DI], CX d) MOV CL, [BX + 10] e) MOV 7[BP][SI], AX  b) 8086 supports 256 interrupt types.Write a detailed note on all types of interrupts | (CO2) | [Comprehension] |
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| 16 | The architectural block diagram of 8086 processor shows many flag registers,address and data buses etc.With a neat block diagram Explain in detail the architecture of 8086 processor. | (CO1) | [Comprehension] |
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