



## Bahria University, Islamabad Campus

### Department of Computer Engineering

#### Mid-Term Examination

Class/Section: BCE-5 (A) Morning

(Fall 2020 Semester)

**Paper Type: Descriptive**

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Course:	Microprocessor and Interfacing	Date: 15-12-2020
Course Code:	CEN-321	Time: Session I
Faculty's Name:	Dr. Jabran Khan	Max Marks: 12 (60% of Total)
Time Allowed:	90 mins (9:00am – 10:30am)	Total Pages: 2 (including this)

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#### **INSTRUCTIONS:**

- I. All questions are compulsory.
- II. There are total four questions.
- III. Viva part is of 08 marks (40% of Total) and will be conducted in next theory class.
- IV. Draw neatly labelled diagrams where necessary.
- V. Solve the paper either on a word processing application (e.g. MS Word) OR by hand (on A4 sized sheets).
- VI. Mark page number on each page of the answer script in format x of y (e.g. page 2 of 5)
- VII. In case the solution is written on a computer (using MS Word), Convert your file to PDF using "Save As", "Export" or "Print" options depending on your software type and version. Software like CutePDF Writer, PDFCreator etc. can also be used to convert documents into PDF.
- VIII. In case the solution is handwritten, on top of first page, put the student/exam information. Scan the answer script using a scanner device or a mobile scanning application (e.g. ClearScanner, CamScanner, MS Office Lens etc).
- IX. Make sure the scanned document is in PDF format and is clear so that the teacher can assess it.
- X. Upload answer script in PDF FORMAT ONLY (In a single file).
- XI. Plagiarized paper or question shall carry **zero** marks.

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Student's Name: \_\_\_\_\_ Enroll No: \_\_\_\_\_  
(USE CAPITAL LETTERS)

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For all questions use the following information:

- **R = Last three digits of your roll number.** For example, if your roll number is 01-242202-057 then **R = 057**.
- **S = R % 4.** For example, if **R = 057** then **S = (57 % 4) = 1**  
(Note: Here % represents mod operator and gives you remainder)
- If S=1, and **A=S+2** is written in any question, use **A=3**(i-e, S+2=1+2)

**Question 01:** (CLO1-C2) [3]

- (a) If CS is 0236H and IP contains (R+100) H. **Give** the physical address used for the execution of next instruction?
- (b) **Give** the name of addressing modes for the statements MOV AX, [DI + R]?
- (c) If AX=1234H, then **predict** the output for the instruction XOR AX, R H?

**Question 02:** (CLO1-C2) [2]

**Transform** the following C code to 8086 compatible assembly code

(Hint: Use any suitable registers for variable)

```
int A = (S+2), B = 0, Sum = 0;
While ( A != 0 ) {
    B = B+1;
    Sum = Sum + B;
    A = A - 1;
}
```

**Question 03:** (CLO2-C4) [5]

**Analyze** to write 8086 compatible assembly instructions for the following. Also provide the results of destination registers/memory locations after each instruction (using proper comments):

Initialize the registers and memory locations using following data:

AX = 1000H	BX = 2000H	CX = 3000H	DX = 4000H
CS = 0100H	DS = 0700H	BP = (R+S) H	SP = 2400H
DS:[10] = S+22H		DS:[11] = S+33H	
DS:[12] = S+44H		DS:[13] = S+55H	

- (a) AND the contents of AX and DS:[10] and save result at DS:[RH]
- (b) XOR the contents of DS: [12H] with DS: [13H] and save result at DS: [RH]
- (c) Add 32-bit data contents starting at DS:[10H] with 34567890H and save result starting at DS:[R H]
- (d) Compare the contents of BP with CX register and comment the values of Flag register. Also show step by step binary subtraction in your work.
- (e) Rotate S times the contents of DX register and comment its result.

**Question 04:** (CLO2-C4) [2]

**Analyze** the following series to write a procedure named 'FIBO' to calculate the sum of Fibonacci series up to X-terms. Write additional instructions to call this 'FIBO' procedure with X=(S+10) and X=(S+15) and save the result after each procedure to the top of stack?

The Fibonacci series is given below:

1 1 2 3 5 8 13 21 ....

Sum of series to (5) terms = 1+1+2+3+5

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*The End of Question Sheet*

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