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Daffodil International University

Faculty of Engineering

Department of Information & Communication Engineering (ICE)

Mid-Term Examination, Fall 2026

Course Code: ICE 1141 **Course Title: Computer Fundamentals**

Level:1 Term:1 **Course Teacher: Adnan Ibney Faruq (AIF)**

Time: 1:30 Hrs **Marks: 25**

Answer to question No. 01 and 02 is Compulsory.

Answer any three from Questions 03-06

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1) a) **Justify** that adding the same numbers in hexadecimal and in octal leads to different results with given example. [3]

234.65 + 66.03

29A.68

322.7

[CLO-2, C/4]

b) **Outline** the functions of the Arithmetic Logic Unit (ALU), Control Unit (CU), and Central Processing Unit (CPU), and show how they work together to form a computer system. [2]

[CLO-3, C/2]

2) a) **Formulate** a new number system using a base of your choice, excluding bases 2, 8, 10, and 16. Define the symbols (digits) used in your number system and represent a suitable number using your newly created system. [2]

[CLO-2, C/5]

b) **Perform** the binary subtraction of $(1000001000)_2 - (0101000111)_2$ show all intermediate borrow operations and carry values clearly, and express the final answer in binary. [3]

[CLO-2, C/3]

00 11 000001

3) a) **Define** BCD and EBCDIC and list the number of bits used in each encoding scheme. [2]

7 8

[CLO-2, C/1]

b) **Perform** the subtraction of $(51)_8$ from $(13)_8$ using the complement method. Show all necessary calculations and express the final answer in base 8. [3]

[CLO-2, C/3]

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4) a) **Analyse** the differences between primary storage and secondary storage in terms of their characteristics, accessibility, speed, and data retention. Support your analysis with suitable examples.

[CLO-3, C/4]

b) **Convert** the decimal numbers 1234 and −8976 into their respective zoned decimal representations, and then convert them into packed decimal format. Show all the steps clearly. [5]

[CLO-2, C/3]

Character	EBCDIC Code		Hexadecimal Equivalent
	Zone	Digit	
0	1111	0000	F0
1	1111	0001	F1
2	1111	0010	F2
3	1111	0011	F3
4	1111	0100	F4
5	1111	0101	F5
6	1111	0110	F6
7	1111	0111	F7
8	1111	1000	F8
9	1111	1001	F9

Figure 1: supporting table for question 4(b)

5) **Explain** the different generations of computers, highlighting the key hardware technologies, software developments, and major characteristics of each generation. [5]

[CLO-3, C/2]

6) **Calculate** the product of $(10100)_2$ and $(111)_2$ using the binary multiplication method. Show all intermediate steps and express the final answer in binary. [5]

[CLO-2, C/3]