International Islamic University Chittagong
Department of Computer Science & Engineering
Mid Term Examination [Special Batch], Autumn 2023
CSE 1121 Computer Programming I
Total marks: *30* Time: 90 minutes

[Answer *all* the following questions. Figures in the right-hand margin indicate full marks.]

1. a) Who have developed C and where? | 1 CO

   b) Determine which of the following are valid *identifiers*? If invalid, explain why? | 2.5 CO
      i) CSE-1121 ii) Float iii) _abc iv) 1ST
      v) Computer Programming

   c) Name and describe four *basic data types* in C with example. | 2.5 CO

   OR

   Name and describe four *constants* in C with example.

   e) Given the **Basic** of an employee. Write i) *flowchart* ii) *algorithm/code* to compute an employee's | 4 CO
      Gross pay and **Net pay** using the formulas-

      ```
      Gross = Basic + House Rent + Medical Allowance
      Net = Gross - Tax
      ```

      Tax is subtracted from the **Gross** only if an employee earns more than **TK.10000**. Otherwise, deduct no **Tax**. Tax rate is **15%** of **Gross** pay. **House Rent** is **50%** of **Basic** and **Medical Allowance** is Tk. **1000**.

2. a) A C program contains the following declarations and initial statements: | 2 CO
      ```
      int i = 40, j = 25, k;
      float x = 3.7, y = 5.3, z;
      ```
      Determine the value of each of the following assignment expressions. Use the values originally assigned to the variables for each expression. Show the calculations.
      i)   k = i % j   iii) y += (j/2)
      ii) z = k = x   iv) k = (j == 25) ? --i : j++

   b) A C program contains the following declarations and initial assignments: | 2 CO
      ```
      int i = 9, j = 7;
      double x = 7.5, y = -2.8;
      char c = 'I',
      ```
      Determine the value of each of the following expressions, which involve the use of library functions.
      i) abs(i - 2 * j)   iii) pow(2, i)
      ii) ceil(x + y)   iv) islower(c)

   c) What would be the output of the following code segment: (use separate boxes for each digit, blank space and other symbols)? | 2 CO
      ```
      int m = 2023;
      float x = 34.768234;
      i)   printf("%-8d\n",m);
      ii)  printf("%8.2f\n",x);
      ```

   d) Write a C program that will take three numbers as input, denoting the lengths of three sides of a triangle. Your program will output the area of the triangle if it is a valid one. Otherwise, it will write "No triangle possible". | 4

Sample Input	Sample output
1.0 1.9 3.0	No triangle possible
3.0 4.0 5.0	6.00

[OR]

Write a C program that will take three integers number A, B, C. Your task is to find the summation of any **two numbers** that are equal to **another number**.

Sample Input	Sample output
4 9 5	Yes
2 3 8	No

In the first test case, $4 + 5 = 9$ the solution exist. So print "Yes".
In the second test case, the summation of any two number is not equal to another number. So print "No".

3. a) The following is a segment of a program: 2   CLO2

```
x = 10;
y = AA;    //Here AA is the last two digits of your ID
if (n > 0 )
    x = x - 5; y = y + 7;
printf("x = %d y = %d", x, y);
```

What will be the values of x and y if n assumes a value of i) 5 and ii) = −2 ? Explain with rough calculations.

b) Write a *switch* statement that will examine the value of an integer variable called *bus* and print   2   CLO2
one of the following messages, depending on the value assigned to *bus*:

Agrabad, if *bus* has a value 1
Chawkbazar, if *bus* has a value 2
Boddharhat, if *bus* has a value 3
Mirsharai, if *bus* has a value 4
Out of range of transport facility, if *bus* has any other value.

c) What will be the output of the following code segments.   2   CLO2

i)
```
x = 5; y = 50;
while (x <= y)
{
    y = y / x;
    printf("%d %d\n",x,y);
}
```

ii)
```
int i;
for (i=1; i<30; i*=3)
{
    printf("%d ",i);
}
```

d) You are given a number X. Print all the divisors of X and sum of the all even divisors of X. A   4   CLO2
number N is a divisor of X if N divides X i.e. if we divide X by N the remainder is zero. If there
is no even divisor print NULL.

Sample Input	Sample output
16	1 2 4 8 16 SUM = 30
21	1 3 7 NULL

Here in the first example divisors of 16 are: 1, 2, 4, 8 and 16. Sum of the all even divisors of 16 is $2+4+8+16 = 30$.

[OR]

Write a C program to calculate the sum of digit of a given positive integer number. [For example, if we take 786 as input then the output should be 21 because 7+8+6=21]

International Islamic University Chittagong
Department of Computer Science and Engineering
B. Sc. in CSE, Midterm Examination, Autumn 2023
Course Code: CSE-1223   Course Title: Discrete Mathematics
Total marks: 30   Time: 1 hour 30 mins
[Figures in the right-hand margin indicate full marks.]

1.

a) Define Cardinality of set. Explain with example. — 1 CLO1

b) Use set builder notation to give a description of each of the following set: i){2,4,6,8,10} ii){a,e,i,o,u} iii){1,4,9,16} iv){2,3,5,7} — 2 CLO2

c) Prove that $(A \cap B)' = A' \cup B'$ using computer representation of set i.e. bit string. Consider, U={0,1,2,3,4,5,6,7,8,9}, A={2,5,9} and B={3,6,8,9} — 3 CLO2

or) Let U={ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A = {1, 3, 5, 7, 9}, B = {2, 4, 6, 8, 10} and C = {1, 2, 3, 4, 5}. What bit strings represent the following:
i) B⊕C ii) A-B

d) In a survey there are 90 students, it was found that-50 had taken C++, 35 had taken Discrete mathematics and 45 had taken Competitive programming. 15 had taken C++ and Discrete mathematics, 20 had taken Discrete mathematics and Competitive programming, 18 had taken C++ and Competitive programming and 10 had taken all the three subjects. Find the number of students that had — 4 CLO2
i) read exactly two subjects ·
ii) read none of the subjects
iii) read exactly one subject

2.

a) Write down the importance of quantification with example. — 2 CLO2

b) Consider the following propositions: — 2 CLO2
   p: "The weather is sunny."
   q: "I will go for a walk."
   r: "I will take an umbrella."
Translate the following propositions into English statements using the provided propositions:
a) p ∧ q b) ¬r c) p → r d) q ↔ r

c) Consider the following predicates: — 3 CLO2
L(x): "Student x loves mathematics.", S(x): "Student x studies regularly." , H(x): "Student x has high grades."
Given the domain of all students in your class, translate the following quantifier expressions into English statements using the provided predicates:
i) $(\forall x) L(x) \rightarrow S(x)$
ii) $(\exists x) H(x) \wedge \neg S(x)$
iii) $(\exists x) (\forall y) (x \neq y \rightarrow L(x) \rightarrow L(y))$

or) Consider the following predicates:
A(x): "Animal x can fly.", B(x): "Animal x has feathers.", C(x): "Animal x is a carnivore."

Given the domain of all animals, translate the following English statements into quantifier expressions using the provided predicates:
  i)   "All animals that can fly have feathers."
  ii) "There exists an animal that is a carnivore and can fly."
  iii) "No animals that have feathers are carnivores."

d) Show $\neg(p \rightarrow q)$ is logically equivalent to $p \wedge \neg q$.　　　　3 Cl

3.
a) Write down the difference between one-to-one and onto function with proper example.　　　　2 C

or) Given sets $A=\{1,2,3,4\}$ and $B=\{2,4,6,8\}$, determine the zero-one matrices that represent the following relations R1 to R4:
i) $R1=\{(1,2),(2,4),(3,6)\}$　　ii) $R2=\{(1,1),(2,4),(3,9)\}$
iii) $R3=\{(2,3),(4,6),(3,9)\}$　　iv) $R4=\{(1,2),(2,4),(2,6)\}$

b) Suppose that g is a function from A to B and f is a function from B to C.　　2 C
Prove each of these statements.
i) If $f \circ g$ is onto, then f must also be onto.
ii) If $f \circ g$ is one-to-one, then g must also be one-to-one.

or) Find the domain and range of these functions. Note that in each case, to find the domain, determine the set of elements assigned values by the function.
  i)   the function that assigns to each nonnegative integer its last digit
  ii) the function that assigns the next largest integer to a positive integer

c) A person deposits $1000 in an account that yields 9% interest compounded annually. Set up a recurrence relation for the amount in the account at the end of n years.　　2

d) For each of these relations on the set $\{1, 2, 3, 4\}$, decide whether it is reflexive, whether it is symmetric, whether it is antisymmetric, and whether it is transitive.　　4
  i) $\{(2, 2), (2, 3), (2, 4), (3, 2), (3, 3), (3, 4)\}$ .Trans
  ii) $\{(1, 1), (1, 2), (2, 1), (2, 2), (3, 3), (4, 4)\}$ tie
  iii) $\{(2, 4), (4, 2)\}$
  iv) $\{(1, 1), (2, 2), (3, 3), (4, 4)\}$

INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG
Morality development program (MDP)
Mid-term examination
Autumn- 2023
2nd semester for Muslim Student (other than Sharia)
Course Title: Tajweedul Qur'aan – II
Course Code- MDP-1202

Time: 1.30   Full marks: 30

Answer any three of the following questions

Question- 1

Answer the questions below   5 X 2=10

a) What are the types of Noon Saakin? Write their names.
b) What are Nun Sakin and Tanvin? Write with Examples.
c) How many kinds of Gunna are there in the Holy Quran? Write their names.
d) What does Iqlaab mean? And write the letters of Iqlab with some examples.
e) How many letters are there in Idgam of Nun Sakin? write them down.

Question- 2   10

Write the classification of Meem Saakin in detail.

Question- 3   10

Explain the rules of Noon Sakin & Tanween in the underlined words below.

- مِنْ بَعْدُ

- مَنْ يفعل

- رِزْقًا لَّكُمْ

- وَمَا هُمْ بِمُؤْمِنِيْنَ

- وَهُمْ مُهْتَدُونَ

بَفِ سَمِيعٌ بَصِيرٌ

OR

Write the meaning of the following surahs. (any two)
  a) Surah Quraish   5 X 2=10
  b) Surah Kawsar
  c) Suratul Maa'un

Course Title: Basic Principles of Islam
Full Marks: 30

Course Code: URED-1201
Time: 1 hour & 30 minutes

Answer all questions. The right side columns contain marks, CLOs and Bloom's taxonomy domain for each question.

#	Questions	Marks	CLOs	Bloom's taxonomy domain
1.	Define Islam literally and terminologically. Explain some important characteristics of Islam elaborately.	10	2	Remember & Create
2.	(a) "Belief in *Tawheed* ought to change a person's life"- evaluate this statement by focusing on the definition, types, and importance of *Tawheed*. **Or.** (b) Who are Angles? What is their nature and what are their functions? Explain proving them as special creations of Allah.	10	2	Remember, evaluate & Create
3.	Make a comparison among all Prophets and Messengers proving Muhammad (SAAS) as the greatest, the best and the last of all Prophets and Messengers with proper evidence.	10	2	Create

International Islamic University Chittagong
Department of Computer Science and Engineering

Mid Term Examination, Autumn-2023   Program: B.Sc. Engineering in CSE
Course Code: EEE-1121   Course Title: Basic Electrical Engineering
Time: 1 hour 30 minutes   Full Marks: 30
        [Answer all the questions from the followings. Figures in the right margin indicate full marks]
            Course Outcomes (COs) and Blooms Levels are mentioned in additional columns.   **Marks**

1) a) Explain ohm's law and Find V_1 & V_2 and in the circuit of Fig.01.
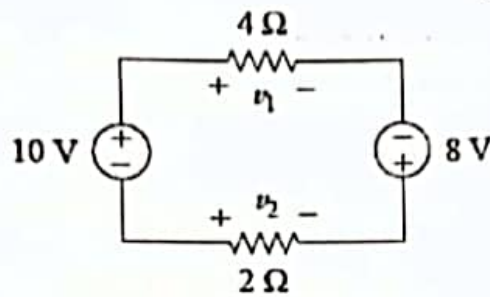
CO1   Ap   5

Fig.01

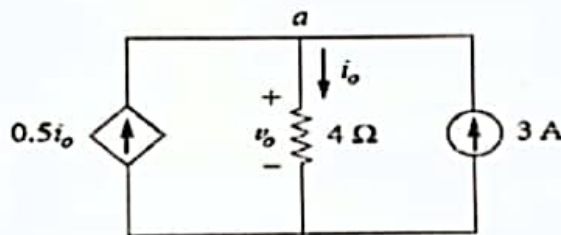1) b) Explain KCL and Find current i_O and voltage v_O in the circuit shown in Fig.02.

CO1   AP   5

Fig.02

2) a) What type of circuit analysis do you think you should use to find V_o in the circuit of Fig. 03 also with proper explanation find v_0.
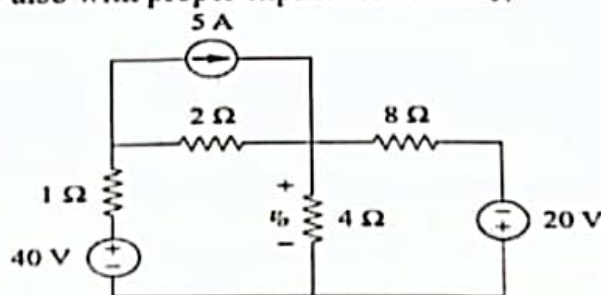
CO2   E   5

Fig.03

2) b) Using mesh analysis find i_1, i_2 and i_3 from the circuit of Fig.04.

CO2   An   5

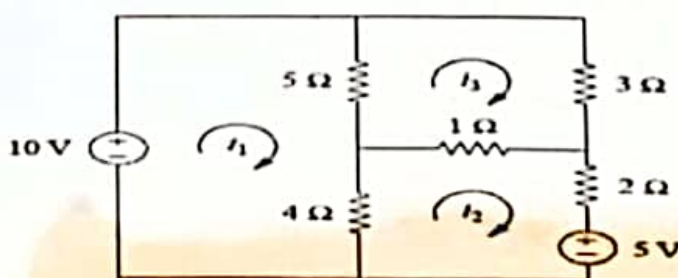**Fig. 04**

3) - a) Explain source transformation and using source transformation determine the current and power in the resistor 8Ω from **Fig.05**
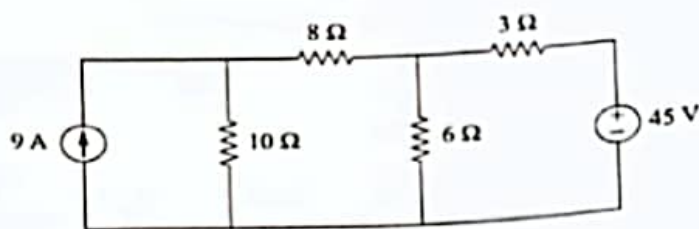
CO2 E 5

Fig.05

OR

3) a) State Thevenin's Theorem. Find the Thevenin equivalent circuit of the circuit in **Fig.06** to the left of the terminals and also find I.
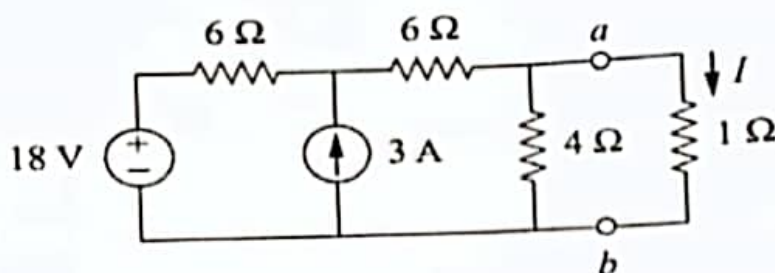
CO2 E 5.

Fig.06

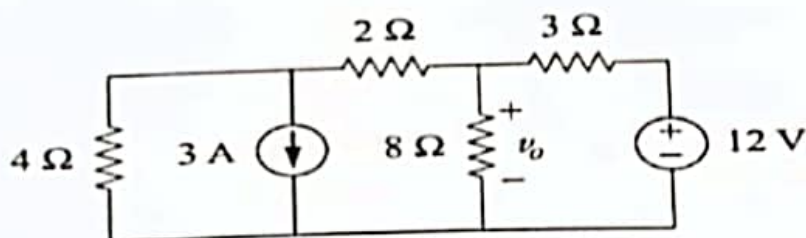3) b) Use superposition to find V_0 in the circuit of **Fig.07**.

CO2 Ap 5

Fig.07

OR

3) b) Using any of the circuit theorem you learned find V_x in the circuit of **Fig.08** also explain the theorem in details.
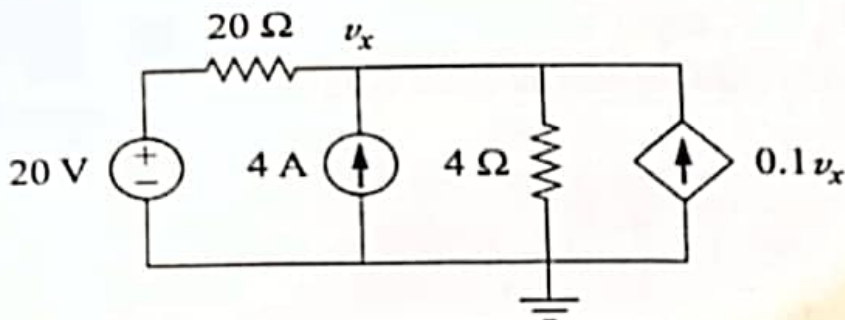
CO2 Ap 5

Fig.08

International Islamic University Chittagong
Department of Computer Science and Engineering
B. Sc. in CSE
Mid-Term Examination, Autumn-2023

Course Code: PHY 1201
Time: 1 hour 30 minutes

Course Title: Physics-II

Full Marks: 30

(i) The figures in the right-hand margin indicate full marks
(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

Course Outcomes (COs) of the Questions	
CLO1	Understand the basic knowledge of different areas of physics like electromagnetism, structure of matter and modern physics as well as engineering aspect.
CLO2	Apply mathematical knowledge to formulate and solve engineering problems.

Bloom's Levels of the Questions						
Letter Symbols	R	U	App	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

[Answer the questions from the followings]

1.	a)	State and explain Coulomb's law for electrostatics.	CLO1	R · 2
	b)	Derive an expression for electric field due to a long uniformly charged wire.	CLO1	U 5
	c)	A cylinder of large length has a charge of 2×10^{-8} Cm^{-1}. Find the electric field at a distance of 0.2 m from it.	CLO2	A 3

2.	a)	State Biot-Savart law.	CLO1	R 1
	b)	Applying Biot-Savart Law, derive an expression for the magnetic field due to a long straight wire carrying current.	CLO1	U 6
	c)	Find the magnetic induction at a centre of a square current loop of side 2 metre carrying a current of 2 ampere.	CLO2	A 3

3.	a)	State the Faraday's laws of electromagnetic induction.	CLO1	R 1
	b)	Find out an expression for the decay of charge in capacitor and the growth of current in the circuit.	CLO1	U 6

Or

Define self Inductance. Deduce a mathematical expression for the self inductance of a solenoid.

	c)	A 1 µF capacitor is allowed to discharge through an unknown resistance. If the charge on the capacitor takes 31.65 seconds to drop to half of its original value, what is the value of the resistance?	CLO2	A 3

Or

A solenoid having an air core and 10 cm long has 110 turns and its area of cross-section is 4 cm². Find the co-efficient of self-inductance of the solenoid