

International Islamic University Chittagong
Center for General Education (CGED)
 Midterm Examination, Spring-2023

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. | “Islam is the guarantee of peace for whole of the world”- explain this statement mentioning the definition and characteristics of Islam. | 10 | 1 | Remember & Create |
| 2. | “Shirk is the greatest sin which destroys our ‘Ibadah’- evaluate this statement explaining some types and examples of Shirk in our contemporary lives. | 10 | 2 | Evaluate & Create |
| 3. | a. “Muhammad (SAAS) is the greatest and the last of all Prophets”- prove this statement with proper evidence. Or, b. “The life of <i>Akhirah</i> is an eternal and endless life”- explain this statement mentioning the logic and impact of <i>Akhirah</i> . | 10 | 3 | Evaluate & Create |

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International Islamic University Chittagong

Morality Development Program (MDP)

Mid-Term Examination, Spring – 2023

2nd Semester (For Muslim Students only; other than Shari'ah faculty)

Course Title: Tajweedul Quran - II

Course Code: MDP 1202

Time: 1.30 Hours

Full Marks: 30

Answer Any three (03) of the following Question

Question No. 1.

5+5=10

Write the meaning of following Surahs: (Any Two)

A. Surah AL - Ma'un (سورة الماعون)

B. Surah AL - Kawther (سورة الكوثر)

C. Surah AL - Quraish (سورة القریش)

Question No 2.

10

Write the Classification of Nun Sakin & Tanween with Example.

Question No 3.

5X2=10

Identify the rules of Noon Sakin & Tanween in the underlined words below mentioning reasons: (any five)

كنت ترابا - فاما من ثقلت - والملك صفا صفا - إلا من ضربيع - من بعده - عن صلاتهم - الدنيا -
لبنبذن

Question No 4.

5X2=10

Identify the rules of Meem Saakin in the underlined words below mentioning reasons: (any five)

ولهم ما يشتهون - ترميهم بحجارة - أطعهم من جوع - وأنتم مسلون - أم أنتم صامتون - أم دنناكم -
يمحو الله - أم به جنة

International Islamic University Chittagong

Department of Computer Science & Engineering

B.Sc. in CSE, Mid Term Examination, Spring 2023

Course Code: CSE-1221 Course Title: Computer Programming 2

Total Marks: 30 Time: 90 minutes

Answer all 3 from the following Questions. Figures in the right-hand margin indicate full marks

3

1 a) Find errors, if any, in the following C++ statements:

1. `cout << "x="x;`
2. `m = 5; // n = 10; // s = m + n;`
3. `cin >> ::x >> y;`
4. `cout << \n "Name: " << name;`
5. `cout << "Enter value:"; cin << x;`
6. `/*Addition*/ z = x + y;`

b) Identify the error, correct the code if any error found.

4

| i) | ii) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre>#include<iostream> using namespace std; class A{ int i; }; void set(A ob, int x){ ob.i = x; } int main() { A ob; set(ob,6); return 0; }</pre> | <pre>#include <iostream.h> class Room { int width, height; void setValue(int w, int h) { width = w; height = h; } void main(){ Room obj; obj.setValue(12, 5); } }</pre> |

c) Write a C++ program to display the following output using a single `cout` statement.

1

```
Math = 90
Physics = 77
Chemistry = 80
```

d) What are the differences between public and private class members?

2

Explain encapsulation with a suitable example.

Or,

What do you mean by object and class? Describe the characteristics of object-oriented programming.

2 a) Describe when we need to use in-line function? When it is not recommended?

2

Or,

How to use private member variables of a class in a non-member function of that class?

Explain with an example.

b) Correct the following code and explain the reason:

2

```
#include <iostream>
using namespace std;
class flower{
    int PL, LL;
public:
    flower(int PL, int LL){
        PL = PL;
        LL = LL;
    }
    void show(){
        cout << PL << " " << LL << endl;
    }
};
int main()
{
```

```
    flower f1(12,10), f2(1,55);
    f1.show();
    return 0;
}
```

- c) Complete the following incomplete code and write the output by creating a class called "Time", where *hour* and *minutes* are two private member variables: 2

```
void addTime(Time t1, Time t2){
    int Hr = t1.hour + t2.hour + (t1.minutes + t2.minutes)/60;
    int Mn = (t1.minutes + t2.minutes)%60;
    cout << Hr << " Hour " << Mn << " Minutes" << endl;
}
int main()
{
    Time T1(12,10), T2(1,55);
    addTime(T1, T2);
    return 0;
}
```

- d) Write a class named "Student" with necessary private member variables. 4

Create 100 student objects in main function.

Take input for each object using cin in a member function of Student class.

Or,

Write a program that would print the information (name, year of joining, salary, address) of 100 employees by creating a class named 'Employee'. The output should be as follows:

Deniyel 1992 Chicago

Samuel 1994 NY

Bruce 1990 South Carolina

- 3 a) Write a code, where following two statements can be written in main function properly. 3
- ```
Employee E1(10, 3000);
Employee E2 = E1;
```

Where, 10 and 3000 are id and salary; E1 and E2 are two objects of Employee class.

- b) Can we have more than one constructor in a class? Explain your answer with necessary code. 2

Or,

What is the problem in the following code? Explain.

```
#include <iostream>
using namespace std;
void pri(int z = 0, int x){
 cout << x << endl;
}
void pri(int a){
 cout << a << endl;
}
int main()
{
 pri(5);
 return 0;
}
```

- c) Write a program demonstrating passing object by reference. How passing object by reference solves the problems(s) associated with passing object by value? 3

- d) Explain the reason of the use of copy constructor. In which situations copy constructor is called? 2

# International Islamic University Chittagong

## Department of Computer Science and Engineering

*B. Sc. in CSE Midterm Examination, Spring 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]

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1a) What is Power Set &amp; Proper Subset? Explain with example. <span style="float: right;">2 CLO1</span></p> <p>1b) Define Cartesian product. Explain why <math>(A \times B) \times (C \times D)</math> and <math>A \times (B \times C) \times D</math> are not the same. <span style="float: right;">2 CLO1</span></p> <p>1c) Let <math>U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}</math>, <math>A = \{1, 3, 5, 7, 9\}</math>, <math>B = \{2, 4, 6, 8, 10\}</math> and <math>C = \{1, 2, 3, 4, 5\}</math> <span style="float: right;">3 CLO2</span></p> <p>What bit strings represent the following: i) <math>A \oplus B</math> ii) <math>\bar{C}</math></p> <p>1d) State whether each of the following sets is finite or infinite. When the set is finite indicate the number of elements it possesses; <span style="float: right;">3 CLO2</span></p> <p>(a) The set of odd positive integers;</p> <p>(b) The set of all integers, whose squares are less than 45,</p> <p>(c) The set of integers satisfying the equation <math>x^2 - 5x + 6 = 0</math></p> |
| <p>2a) What is Prepositional Logic? Prove that <math>\neg(A \vee B)</math> and <math>[(\neg A) \wedge (\neg B)]</math> are Propositionally equivalent by using truth table. <span style="float: right;">1+2 CLO1, CLO2</span></p> <p>2b) Proof that <math>[(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)] \rightarrow r</math> is a tautology. <span style="float: right;">3 CLO2</span></p> <p>2c) Let p, q and r be the propositions<br/>     p: Sadia has fever<br/>     q: Sadia absent in discrete mathematics mid exam<br/>     r: Sadia attend in the final exam<br/>     Express each of the proposition in English sentence<br/>     i) <math>p \rightarrow q</math> ii) <math>(p \rightarrow \neg r) \vee (q \rightarrow \neg r)</math> iii) <math>\neg q \leftrightarrow r</math> iv) <math>(p \wedge q) \vee (\neg q \wedge r)</math> <span style="float: right;">4 CLO2</span></p>                                                                                                                                                |

**OR,**

Let p and q be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," respectively. Express each of these compound propositions as an English sentence.

i)  $p \rightarrow \neg q$ , ii)  $p \leftrightarrow \neg q$ , iii)  $\neg p \wedge (p \vee \neg q)$ , iv)  $\neg q \leftrightarrow p$

- |                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>3a) Show that the function <math>f(x) = e^x</math> from the set of real numbers to the set of real numbers is not invertible, but if the codomain is restricted to the set of positive real numbers, the resulting function is invertible. <span style="float: right;">2 CLO2</span></p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**OR,**

Determine whether each of these functions from  $\mathbf{Z}$  to  $\mathbf{Z}$  is one-to-one.

a)  $f(n) = n - 1$     b)  $f(n) = n^2 + 1$

- |                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>3b) Give an example of a function from <math>\mathbf{N}</math> to <math>\mathbf{N}</math> that is<br/>     a) one-to-one but not onto.    b) onto but not one-to-one.<br/>     c) both onto and one-to-one    d) neither one-to-one nor onto. <span style="float: right;">4 CLO1</span></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- |                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>3c) Define Relation with example. Let R and S be relations from A-A, where <math>A = \{1, 2, 3, 4\}</math> and: <span style="float: right;">1+3 CLO1, CLO2</span></p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

$R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3), (2, 1), (3, 1), (3, 2)\}$

$S = \{(2, 3), (1, 2), (2, 1), (3, 1), (1, 3)\}$

a. Find if these relations are symmetric, reflexive, and transitive.

**OR**

Define *Function* and *Inverse Function* with proper example. Find  $f \circ g$  and  $g \circ f$ , where  $f(x) = x^2 + 2x + 5$  and  $g(x) = 2x + 3$ , are function from R to R.

International Islamic University Chittagong  
 Department of Computer Science and Engineering  
*B. Sc. in CSE Mid Examination, Spring- 2023*  
 Course Code: EEE-1221 Course Title: Electronics

**Total marks: 30 Time: 1.5 hours**

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

1. a) Suppose an electronic device requires the same output polarity for any polarity of the ac input. Design a rectifier using two diodes to get the required output and derive the efficiency of a full-wave rectifier. 7 CO2 A
- b) A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at  $20\ \Omega$ . The transformer r.m.s. secondary voltage from center tap to each end of secondary is 50 V and load resistance is  $980\ \Omega$ . Find 3 CO2 A
- Mean load current.
  - R.m.s. value of load current.
  - Rectifier efficiency.

2. a) Draw the symbol of an N-P-N transistor and briefly explain it's construction and working principle. 6 CO4 U

Or

Draw the three transistor configurations – Common Base, Common Emitter, and Common Collector configurations. For a Common Emitter configuration, establish the relation between  $\alpha$  and  $\beta$  as given by –

$$\beta = \frac{\alpha}{1 - \alpha}$$

- b) For the common base circuit shown in Fig. 2(b), determine  $I_C$  and  $V_{CB}$ . Assume the transistor to be Silicon. 4 CO4 A

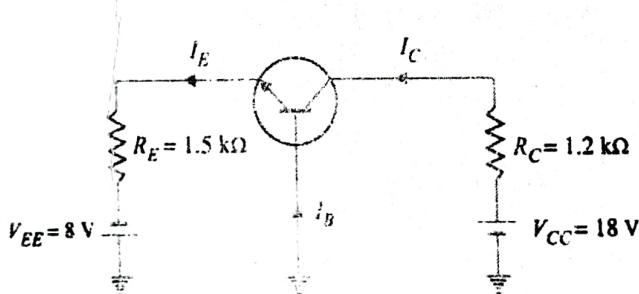


Fig. 2(b)

Or

A transistor is connected in Common Emitter configuration in which collector supply is 8 Volts and voltage drop across  $R_C$  connected in the collector circuit is 0.5 Volts. The value of  $R_E = 800\ \Omega$ . If  $\alpha = 0.96$ , determine:

- Collector emitter voltage ( $V_{CE}$ ).
- Base current ( $I_B$ ).

- Q3(a) Define clapper. Draw and explain the circuits of (i) positive, and (ii) negative clapper with input and output waveforms. 7 CO2 A

(b) Sketching the output waveform for the circuit shown in Fig. 3(b). It is given that the discharging time constant ( $CR_L$ ) is much greater than the time period of the input wave.

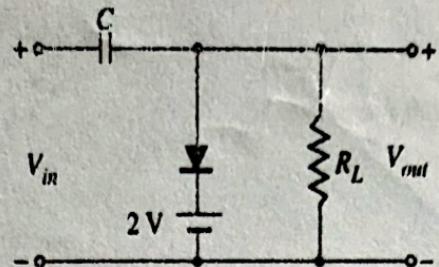
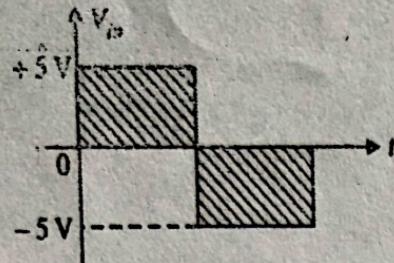


Fig. 3(b)



**International Islamic University Chittagong (IIUC)**  
**Department of Computer Science and Engineering (CSE)**  
**Mid Term Examination**

**Program: B. Sc. in CSE**  
**Course Code: MATH-1207**  
**Time: 1:30 hours**

**Semester: Spring-2023**  
**Course Title: Mathematics-II**  
**Total Marks: 30**

- (i) Answer all the questions. The figures in the right-hand margin indicate full marks.  
(ii) Please answer the several parts of a question sequentially.  
(iii) Course Learning Outcomes (CLOs) and Bloom's Levels are mentioned in additional Columns.

**Course Learning Outcomes (CLOs) of the Questions**

|              |                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>CLO1:</b> | Demonstrate knowledge of geometry and its applications in the real life contexts as well as into complex engineering problems. |
|--------------|--------------------------------------------------------------------------------------------------------------------------------|

**Bloom's Taxonomy Domain Levels of the Questions**

| Letter Symbols | R        | U          | Ap    | An      | E        | C      |
|----------------|----------|------------|-------|---------|----------|--------|
| Meaning        | Remember | Understand | Apply | Analyze | Evaluate | Create |

- |       |                                                                                                                                                              | <b>Marks</b> | <b>CLO</b> | <b>DL</b> |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|-----------|
| 1. a) | What is Transformation of Co-ordinates?<br>Determine the equation of parabola, $x^2 - 2xy + y^2 + 2x - 4y + 3 = 0$ after rotating of axes through $45^\circ$ | 5            | CLO1       | R&U       |
| b)    | Find the bisectors of the angles between the lines represented by the homogeneous second degree equation, $ax^2 + 2hxy + by^2 = 0$                           | 5            | CLO1       | U         |
| 2. a) | Find the value of $c$ so that the following equation may represent pairs of straight lines. $2x^2 - y^2 + xy - 2x - 5y + c = 0$                              | 3            | CLO1       | U         |
| b)    | Test the nature of the conic given by the equation,<br>$6x^2 + 5xy - 6y^2 - 4x + 7y + 11 = 0$                                                                | 3            | CLO1       | U         |
| c)    | Define direction cosine and direction ratio. If a line equally inclined to the axes then show that $\sin \theta = \pm \sqrt{\frac{2}{3}}$                    | 4            | CLO1       | U         |

3. a) Define Plane. Find the equation of the plane through the points  $(2, 2, 1)$  and  $(9, 3, 6)$  and perpendicular to the plane,  $2x + 6y + 6z - 9 = 0$  5 CLO1 R&U

Or. Define Tetrahedron. Find the volume of tetrahedron formed by the four planes,  $by + cz = 0$ ,  $cz + ax = 0$ ,  $ax + by = 0$  and  $ax + by + cz = r$

- b) Define Shortest Distance. Find the shortest distance between the lines 5 CLO1 R&U

$$\frac{x-3}{3} = \frac{y-8}{-1} = \frac{z-3}{1} \text{ and } \frac{x+3}{-3} = \frac{y+7}{2} = \frac{z-6}{4}$$

Or. Define Sphere and Great Circle. Find the equation of the sphere whose centre is  $(2, -3, 2)$  and tangent to the plane  $6x - 3y + 2z = 8$