

Total Marks: 25

Start Time: 1:45 PM

Completion Time: 2:45 PM

Objective:

In this lab, students will learn how to use references and const correctly in class functions.

Instructions:

- 1) Follow the question instructions very carefully, no changes in function prototypes are allowed.
- 2) Your laptops must be on airplane mode.
- 3) Anyone caught in an act of plagiarism would be awarded an “F” grade in this Lab.

TASK-01: Document Editor**[25 Marks]**

You are to implement a class named **DocumentEditor** that manages and edits a set of **Paragraphs**. Each paragraph is a piece of text, and the editor supports operations like adding, removing, editing, displaying, saving, and loading paragraphs.

In addition to correct functionality, you are required to carefully decide the return types, parameter types, and whether a function should be marked const.

Your score will be higher if your design is:

- Efficient (no unnecessary copies)
- Safe (no data leaks or accidental modification)
- Clean (uses const and references properly)

Implement the following classes:

```
class Paragraph
{
    string content;

public:
    Paragraph( ... )           // Initializes a paragraph with given text
    setContent( ... )         // Updates the content of the paragraph
    getContent( ... )         // Retrieves the content of the paragraph
    getWordCount( ... )       // Returns the number of words in the paragraph
};
```

```

class DocumentEditor
{
    vector<Paragraph> paragraphs;

public:
    addParagraph( ... )           // Adds a paragraph to the document
    removeParagraph( ... )        // Removes a paragraph at a given index
    getParagraph( ... )           // Returns a paragraph (read-only or modifiable)
    editParagraph( ... )          // Edits a specific paragraph's content
    getTotalWords( ... )          // Returns the total number of words
    getParagraphCount( ... )      // Returns number of paragraphs
    getAllParagraphs( ... )       // Returns all paragraphs for display
    saveToFile( ... )             // Saves current document to file
    loadFromFile( ... )           // Loads paragraphs from file
};

```

You must **choose and justify**:

- Whether a parameter should be passed by value, reference, or const reference
- Whether a function should be const
- Whether a return type should be by value, reference, or const reference