Assignment-05

PART-A

① Explain stream in C++?

→ A stream in C++ represents a flow of data, typically for input or output operations.

- Input stream ('istream') : for input data (ci
- Output stream ('ostream') : for output data (cou
- file streams ('fstream', 'ifstream', 'of stream'): for Reading & writing to files.

② Discuss width() and setw() functions in C++ programming.

→ width(): This member fun^n sets the width for displaying output data in a stream. It specifies minimum no. of characters to be used to display a value.

setw(): This is stream manipulator, "<iomanip> it fun^n similarly to 'width()', setting the field width for next value to be output.

③ What are uses of fill() and setfill() fun^n in C++ programming?

→ fill(): This member fun^n sets the character used for padding in output streams when field width is greater then the actual data. By default, Padding char. is space.

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Setfill(): This is a stream manipulator used to change fill character for Padding. It works like 'fill()', but it is a manipulator that can be used with stream insertion ('<<').

(4) What is the use of showbase manipulator?

→ This manipulator used in streams to indicate that a numeric value should be displayed with its base prefix. Ex:- with hexadecimal no., it display '0x' prefix, and with octal no., it display '0' prefix.

(5) Explain insertion and extraction operators.

→ Insertion Operator ('<<'): This operator is used with output streams to insert data into the stream.

Extraction operator ('>>'): This operator is used with input streams to extract data from a stream, typically reading from the console or a file.

PART-B

(1) Write a C++ program to read contents from a specific file.

→

```
#include <iostream>
#include <fstream>
using namespace std;

int main () {
ifstream infile ("my-file.txt");
                    // Create an input file stream object
if (!infile.is_open())
                    // check if file is open
{
cout << "error opening file" << endl;
return 1;
}

string line;                    // Read content of the file.
while (getline (infile, line))
{
cout << line << endl;           // Print line to consol
}
  infile.close ();              // close the file

return 0;
}
```

② Explain any 3 classes for file stream operations.

→ (i) ifstream: This class is used for input file operations. It allows reading from files, similar to 'istream', and is typically used when you need to extract data from a file.

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(ii) ofstream : This class used for output file operations. It allows writing to files, similar to 'ostream', and generally used when you need to write data to a file.

(iii) fstream : This class combines both input and output operations. It allows you to read from and write to the same file, making suitable for file manipulation tasks, when need both extract & update data.

(3) What is console input/output? Explain 3 standard streams in C++ programming.

→ Console input/output in C++ refers to the process of interacting with the console or command line through standard input and output operations.

(i) Std::cin : This is the standard input stream, typically used to read data from the console. It is uses for extraction operator ('>>') to get user input.

(ii) Std::cout : This is standard output stream, used to send data to console. It uses the insertion operator ('<<') for outputting text or other data types.

(iii) Std::cerr : This is standard error stream, used to output error messages or diagnostics. It ensure that error message

These standard streams are fundamental for basic console-based interaction, providing input, output, and error reporting capabilities in C++ programs.

PART-C

① What do you mean by unformatted console input/output? Explain any 4 unformatted console input/output functions.

→ Unformatted console i/o refers to reading or writing raw data to/from the console without specific formatting. It deal with low-level byte-to-byte operations rather than high level object representation.

① get(): This fun" reads a single character from the standard input (like 'std::cin') without removing it from the buffer. It can be used to get user input one character at a time.

② put(): This fun" writes a single character to the standard output (like 'std::cout'). It useful for simple characters-based output without additional formatting.

③ Read(): This fun" reads a specified no of bytes from a stream into a buffer.

Its typically used for reading binary data from a file.

④ write() : This fun^{n} writes a specified no. of bytes from a buffer to a stream. It is used for outputting raw binary data to a file or console.

```
#Include <iostream>
Int main()
{
  char ch;
  cout <<"Enter a character: ";
  Cin.get(ch);  //Read one char. from input
  cout.put(ch); // Output that char.
  cout.put('\n');
  return 0;
  }
```

② What do you mean by Manipulators? Explain any 6 manipulator with examples.

→ Manipulator in C++ used to modify the behavior of input/output operation. They often control formatting, such as width, precision, or alignment.

Six common manipulators are :-

① setw() : Sets the width of the field for the

next output operation. The output will be padded if necessary.

```
#include <iostream>
#include <iomanip>

int main() {
cout << setw(10) << 42 << endl;
return 0;
}
```

Output " 42"

② setfill(c) : Sets the fill character for padding when using 'setw()'.

```
cout << setw(10) << setfill('-') << 42 <<
                                    endl;
```

Output

"--------42"

③ Set precision (p) : Set the number of digits after decimal pts for floating pt number.

```
#include <iostream>
#include <iomanip>
int main() {
double num = 3.14159265;
cout << setprecision(3) << num << endl;
return 0;
}
```

Output "3.14"

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④ fixed: forces floating-pt numbers to be output with fixed-pt narration

```
cout << fixed << setprecision(2) << 3.14159265
     << endl;
```

Output: "3.14"

⑤ hex/Oct/dec: Set the base for numeric output to hexadecimal/octal/decimal.

```
#include <iostream>
int main() {
int number = 42;
cout << hex << number << endl;
cout << Oct << number << endl;
cout << dec << number << endl;
return 0;
}
```

Output: "2a"
"52"
"42"

⑥ Showbase: Display the base prefix for numeric value (like "0x" for hex "0" for Octal).

```
#include<iostream>
#include<iomanip>
int main() {
int number = 42;
cout << hex << showbase << number << endl;
return 0;
}
```

Output "0x2a"

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③ What is concept of file in a programming language? Write program to copy content of a file into another file.

→ A file in C++ programming context refers to a collection of related data stored on a disk or storage device. file can contain text, binary data, or a combination of both. Programs interact with files to read or write data, providing presistant storage.

· Program

```
#include <iostream>
#include <fstream>
#include <string>

int main()
{
ifstream source file("source.txt"); // Open source file for Read
ofstream dest file("destination.txt"); // Open dest file for write

if (!source file.is-open() || !dest file.is-open())
{
cerr << "Error opening file." << endl;
return 1;
}

String line;
while (getline(source file, line)) // Read line-by-line from source file.
{
destfile << line << endl; // Write each line to dest file.
}
```

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```
Source file.close(); // Close source file
dest file.close(); // Close destination file

cout << "file content copied successfully." << endl;

return 0;
}
```