STUDY MATERIAL

XI COMPUTER SCIENCE
(SCIENCE GROUP)

CHAPTER 15
POLYMORPHISM
&
CHAPTER 17
COMPUTER ETHICS AND CYBER SECURITY

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PART I

CHOOSE THE CORRECT ANSWERS

1. Which of the following refers to a function having more than one distinct meaning?

(A) Function Overloading
(B) Member overloading
(C)Operator overloading
(D) Operations overloading

2. Which of the following reduces the number of comparisons in a program ?

(A) Operator overloading
(B) Operations overloading
(C) Function Overloading
(D) Member overloading

3**. void dispchar(char ch='$',int size=10)**

```
{
for(int i=1;i<=size;i++)
cout<<ch;
}
```

How will you invoke the function dispchar() for the following input?To print $ for 10 times

(A) dispchar(); (B) dispchar(ch,size);

(C) dispchar($,10); (D)dispchar('$',10 times);

4. Which of the following is not true with respect to function overloading?

(A) The overloaded functions must differ in their signature.
(B) The return type is also considered for overloading a function.
(C) The default arguments of overloaded functions are notconsidered for Overloading.
(D) Destructor function cannot be overloaded.

5. Which of the following is invalid prototype for function overloading

(A) void fun (intx); void fun (char ch) ;
(B) void fun (intx); void fun (inty);
(C) void fun (double d); void fun (char ch);
(D) void fun (double d); void fun (inty);

6. Which of the following function(s) combination cannot be considered as

overloaded function(s) in the given snippet ?

```
void print(char A,int B); // F1
void printprint(int A, float B); // F2
void Print(int P=10); // F 3
void print(); // F4
```

(A) F1,F2,F3,F4 (B) F1,F2,F3 (C) F1,F2,F4 (D) F1,F3,F4

7. Which of the following operator is by default overloaded by the compiler?

(A) * (B) + (C) += (D) ==

Based on the following program answer the questions (8) to (10)

```
#include<iostream>
using namespace std;
class Point {
private:
int x, y;
public:
Point(int x1,int y1)
{
x=x1;y=y1;
}
void operator+(Point &pt3);
void show() {cout << "x = " << x << ", y = " << y; }
};
void Point::operator+(Point &pt3)
{
 x += pt3.x;
y += pt3.y;
}
int main()
{
Point pt1(3,2),pt2(5,4);
pt1+pt2;
pt1.show();
return 0;
}
```

ANSWER FOR OBJECTIVES				
1) a	**2)c**	**3)a**	**4)b**	**5)b**
6)b	**7)c**	**8)a**	**9)a**	**10)a**

8. Which of the following operator is overloaded?

(A) + (B) operator (C) **::** (D) =

9. Which of the following statement invoke operator overloading?

(A) pt1+pt2; (B) Point pt1(3,2),pt2(5,4); (C) pt1.show(); (D) return 0;

10. What is the output for the above program?

(A) x=8, y=6 (B) x=14, y=14 (C) x=8, y=6 (D) = x=5, y=9

PART II

ANSWER TO ALL THE QUESTIONS (2 MARKS):

1. **What is function overloading?**

   The ability of the function to process the message or data in more than one form is called as function overloading.

2. **List the operators that cannot be overloaded.**

   a) scope operator **::**
   b) sizeof
   c) member selector **.**
   d) member pointer selector *****
   e) ternary operator **?:**

3. **class add{int x; public: add(int)}; Write an outline definition for the constructor.**

```
add::add (int a)
{
int b=2;
a+=b;
cout<<a;
}
```

4. **Does the return type of a function help in overloading a function?**

   No, the return type of a function does not help in overloading a function. Because It consider only the arguments.

5. **What is the use of overloading a function?**
   1) To reduce the number of comparisons in a program
   2) To make the program to execute faster.
   3) To help the programmer by reducing the number of function names to be remembered.

PART III

ANSWER TO ALL THE QUESTIONS (3 MARKS):

1. **What are the rules for function overloading?**
   1) The overloaded function must differ in the number of its arguments or data types
2) The return type of overloaded functions are not considered for overloading same data type
3) The default arguments of overloaded functions are not considered as part of the parameter list in function overloading.

2. **How does a compiler decide as to which function should be invoked when there are many functions? Give an example.**

   The compiler determines the most appropriate definition to use, by comparing the argument types specified in the definitions.

   Example:

```
float area ( float radius);                          //function with one argument
float area ( float half, float base, float height ); //function with two arguments
float area ( float length , float breadth);          //function with three arguments
```

3. **What is operator overloading? Give some example of operators which can be overloaded.**

- The mechanism of giving special meaning to an operator is known as operator overloading.
- Some examples of overloaded operators are +,++,-,—,+=,-=,*.<,>.

4. Discuss the benefit of constructor overloading?

It gives the flexibility of creating multiple types of objects of a class by having more number of constructors in a class

5. class sale {int cost, discount ;public: sale(sale &);}; Write a non inline definition for constructor specified

```
class sale
{
int cost, discount ;
public:
sale(sale &);
};
   sale::sale(sale s)
   {
   cost=s.cost;
   discount=s.discount;
   }
```

PART IV

ANSWER TO ALL THE QUESTIONS (5 MARKS):

1. What are the rules for operator overloading?

a) Precedence and Associativity of an operator cannot be changed.
b) No new operators can be created, only existing operators can be overloaded.
c) Cannot redefine the meaning of an operator's procedure. You cannot change how integers are added. Only additional functions can be to an operator
d) Overloaded operators cannot have default arguments.
e) When binary operators are overloaded, the left hand object must be an object of the relevant class

2. Answer the question (i) to (v) after going through the following class.

```
class Book
{
int BookCode ;
char Bookname[20];
float fees;
public:
Book( ) //Function 1
{
fees=1000;
BookCode=1;
strcpy (Bookname,"C++");
}
```

```
void display(float C) //Function 2
{
cout<<BookCode<<":"<<Bookname<<":"<<fees<<endl;
}
~Book( ) //Function 3
{
cout<<"End of Book Object"<<endl;
}
Book (intSC,char S[ ],float F) ; //Function 4
};
```

(i) In the above program, what are Function 1 and Function 4 combined together referred as?

Constructor

(ii) Which concept is illustrated by Function3? When is this function called/ invoked?

Function 3 is destructor. *Destructor* gets executed, When a class object goes out of scope.

(iii) What is the use of Function3?

To removes the memory of an object which was allocated by the constructor at the time of creating a object.

(iv) Write the statements in main to invoke function1 and function2

```
Book B;     //Constructor will execute automatically
B.display(5.5);      //Invoking of function
```

(v) Write the definition for Function4

```
Book (int SC,char S[ ],float F)
{
BookCode=SC;
BookName=S;
Fees=f;
}
```

3. Write the output of the following program

```
include<iostream>
using namespace std;
class Seminar
{
int Time;
public:
 Seminar()
 {
 Time=30;cout<<"Seminar starts now"<<endl;
 }
      void Lecture()
{
cout<<"Lectures in the seminar on"<<endl;
```

```
}
Seminar(int Duration)
{
Time=Duration;cout<<"Welcome to Seminar "<<endl;
}
Seminar(Seminar &D)
{
Time=D.Time;cout<<"Recap of Previous Seminar Content "<<endl;
}
~Seminar()
{
cout<<"Vote of thanks"<<endl;
}
};

    int main()
    {
    Seminar s1,s2(2),s3(s2);
    s1.Lecture();
    return 0;
}
```

Output:

```
Seminar starts now
Welcome to Seminar
Recap of Previous Seminar Content
Lectures in the seminar on
Vote of thanks
Vote of thanks
Vote of thanks
```

4. **Debug the following program**

```
#include<iostream>
using namespace std;
class String
{
public:
charstr[20];
public:
void accept_string
{
cout<<"\n Enter String : ";
cin>>str;
}
display_string()
{
cout<<str;
}
```

```
String operator *(String x) //Concatenating String
{
String s;
strcat(str,str);
strcpy(s.str,str);
goto s;
}
}
int main()
{
String str1, str2, str3;
str1.accept_string();
str2.accept_string();
cout<<"\n\n First String is : ";
str1=display_string();
cout<<"\n\n Second String is : ";
str2.display_string();
str3=str1+str2;
cout>>"\n\n Concatenated String is : ";
str3.display_string();
return 0;
}
```

Answer

Error NO.	Error Code	Corrected Code
1	#include<string.h> missing	#include<string.h> header file needs to be added
2	charstr[20];	char str[20];
3	void accept_string	void accept_string()
4	display_string()-return type should be added	void display_string()-
5	String operator *(String x)	String operator +(String x)
6	strcat(str,str);	strcat(str,x.str);
7	goto s;	return s;
8	str1=display_string();	str1.display_string();
9	}- End of the class semicolon missing	};
10	cout>>"\n\n Concatenated String is : ";	cout<<"\n\n Concatenated String is : ";

5. Answer the questions based on the following program

```
#include<iostream>
#include<string.h>
using namespace std;
class comp {
public:
chars[10];
void getstring(char str[10])
```

```
{
strcpy(s,str);
}
void operator==(comp);
};
void comp::operator==(comp ob)
{
if(strcmp(s,ob.s)==0)
cout<<"\nStrings are Equal";
else
cout<<"\nStrings are not Equal";
}
int main()
{
comp ob, ob1;
char string1[10], string2[10];
cout<<"Enter First String:";
cin>>string1;
ob.getstring(string1);
cout<<"\nEnter Second String:";
cin>>string2;
ob1.getstring(string2);
ob==ob1;
return 0;
}
```

(i) Mention the objects which will have the scope till the end of the program.

Object ob,ob1 in the main() function will have the scope till the end of the program.

(ii) Name the object which gets destroyed in between the program

Object ob in operator==(comp ob) function gets destroyed in between the program

(iii)Name the operator which is over loaded and write the statement that invokes it.

- = = is the Overloaded operator in the program
- The invoking statement of operator overloading in the program is **ob==ob1;**

(iv) Write out the prototype of the overloaded member function

The prototype of the overloaded member function is void operator==(comp);

(v)What types of operands are used for the overloaded operator?

User defined datatype class objects are used for the overloaded operator

(vi) Which constructor will get executed? Write the output of the program

Constructor is not defined in the class. So compiler generated default constructor and it will executed

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CHAPTER 17 - COMPUTER ETHICS AND CYBER SECURITY

PART - I

Choose the best Answer.

1. Which of the following deals with procedures, practices and values?

a. piracy b. programs c. virus d. computer ethics

2. Commercial programs made available to the public illegally are known as

a. freeware b. warez c. free software d. software

3. Which one of the following are self-repeating and do not require a computer program to attach themselves?

a. viruses b. worms c. spyware d. Trojans

4. Which one of the following tracks a user visits a website?

a. spyware b. cookies c. worms d. Trojans

5. Which of the following is not a malicious program on computer systems?

a. worms d. Trojans c. spyware d. cookies

6. A computer network security that monitors and controls incoming and outgoing traffic is

a. Cookies b.Virus c. Firewall d. worms

7. The process of converting cipher text to plain text is called

a. Encryption b. Decryption c. key d. proxy server

8. e-commerce means

a. electronic commerce b. electronic data exchange

c. electric data exchange d. electronic commercialization.

9. Distributing unwanted e-mail to others is called.

a. scam b. spam c. fraud d. spoofing

10. Legal recognition for transactions are carried out by

a. Electronic Data Interchange b. Electronic Data Exchange

c. Electronic Data Transfer d. Electrical Data Interchange

ANSWER FOR OBJECTIVES				
1) d	**2)b**	**3)b**	**4)b**	**5)d**
6)c	**7)b**	**8)a**	**9)b**	**10)a**

PART - II

Answer to all the questions (2 Marks):

1. What is harvesting?

A person or program collects login and password information from a legitimate user to illegally gain access to other's accounts is called harvesting

2. What are Warez?

Commercial programs that are made available to the public illegally are often called warez.

3. Write a short note on cracking.

- "Cracking" means trying to get into computer systems in order to steal, corrupt, or illegitimately view data.
- Cracking is where someone edits a program source so that the code can be exploited or modified.

4. Write the types of cyber attacks.

- Virus
- Worms
- Spyware
- Ransomware

5. What is a Cookie?

A cookie is a small piece of data sent from a website and stored on the user's computer memory

PART - III

Answer to all the questions (3 Marks):

1. **What is the role of firewalls?**
   - To monitor and control incoming and outgoing network traffic based on predefined security rules.
   - To establishes a block between a trusted internal computer network and entrusted computer outside the network.
2. **Write about encryption and decryption.**

   Encryption:

   It is the process of translating the plain text data (plaintext) into random and mangled data (called cipher-text).

   Decryption:

   Decryption is the reverse process of converting the cipher-text back to plaintext.
3. **Explain symmetric key encryption.**
   - Symmetric encryption is a technique to use the same key for both encryption and decryption.
   - It is an old and best-known technique.
   - Disadvantage: All authorized persons involved have to exchange the key used to encrypt the data before they can decrypt it.
4. **What are the guidelines to be followed by any computer user?**
   - Complex password setting can make your surfing secured.
   - When the internet is not in use, disconnect it.
   - Do NOT open spam mail or emails that have an unfamiliar sender.
   - When using anti-virus software, keep it up-to-date.

5. What are ethical issues? Name some.

An Ethical issue is a problem or issue that requires a person or organization to choose between alternatives that must be evaluated as right or wrong.

Some of the common ethical issues are listed below:

- Cyber crime
- Software Piracy
- Unauthorized Access
- Hacking
- Use of computers to commit fraud

PART - IV

Answer to all the questions (5 Marks):

1. What are the various crimes happening using computer?

a) Crime function
Hacking, threats and black mailing towards a business or a person

b) Cyber stalking
Harassing through online

c) Malware, or malicious software, is any program or file that is harmful to a computer user.

d) Denial of service attack:
Overloading a system with fake requests

e) Frauds:
Computer fraud is the act of using a computer to take or **alter** electronic data.

f) Harvesting:
A person or program records login and password information from a legitimate user to illegally gain access to their account(s).

g) Identity theft:
It is a crime where the criminals impersonalize individuals, usually for financial gain

h) Intellectual property theft:
Stealing practical or conceptual information developed by another person of company.

i) Salami slicing:
Stealing tiny amounts of money from each transaction.

j) Scam: Tricking people into believing something that is not true.

2. What is piracy? Mention the types of piracy? How can it be prevented?

Piracy

- Making and using duplicate hardware and software is called piracy.
- Software Piracy is about the copyright violation of software created originally by an individual or an institution.

Types of piracy:

- Counterfeiting
- Internet Piracy
- End User Piracy
- Client-Server Overuse

- Hard-Disk Loading

Prevention:

- ✓ Illegal copying and distribution of commercial software should not be practiced.
- ✓ Increase public education and raise awareness about software piracy.
- ✓ Modernize protections for software and other copyrighted materials.

3. Write the different types of cyber attacks.

S.No.	Cyber Attack	Function
1.	Virus	A virus is a small piece of computer code that can repeat itself and spreads from one computer to another by attaching itself to another computer file. One of the most common virus is **Trojan.** A Trojan virus is a program that appears to perform one function (for example, virus removal) but actually performs malicious activity when executed.
2.	Worms	Worms are self- repeating and do not require a computer program to attach themselves.
3.	Spyware	Spyware can be installed on the computer automatically when the attachments are open, by clicking on links or by downloading infected software.
4.	Ransomware	Ransomware is a type of malicious program that demands payment after launching a cyber-attack on a computer system.