**Quiz 1** *(first 10 questions are irrelevant to the topic)*

**Question 11 7.5 pts**

What is a programming paradigm?

1. A common set of hardware instructions for a specific kind of hardware.
2. A set of principles, concepts, and methods that is commonly accepted by members of a group or community.
3. A programming language is a paradigm.
4. A mathematical model.

***Answer:*** 2

**Question 12 7.5 pts**

The compiler executes the program. (True/False)

***Answer:*** False

**Question 13 7.5 pts**

Prolog is a functional programming language. (True/False)

***Answer:*** False

**Question 14 7.5 pts**

Features of the logic paradigm include:

1. Expressing computations in terms of logic predicates.
2. Expressing computations in terms of Boolean expressions.
3. Using lambda calculus.
4. Classes and objects.

***Answer:*** 1,4

**Question 15 7.5 pts**

Features of the functional paradigm include:

1. Expresses computation in terms of mathematical functions.
2. Expresses computations in terms of logic predicates.
3. Polymorphism.
4. Simpler semantics.

***Answer:*** 1,4

**Question 16 7.5 pts**

Interpretation of a program is the direct execution of one statement at a time sequentially. (True/False) ***Answer:*** True

**Question 17 7.5 pts**

Features of imperative or procedural paradigm include:

1. Classes and objects.
2. Manipulation of named data (variables).
3. Conditional statements.
4. Encapsulation.

***Answer:*** 2,3

**Question 18 7.5 pts**

Features of the object-oriented paradigm include:

1. Logic predicates.
2. Classes and objects.
3. Lambda calculus.
4. Inheritance.

***Answer:*** 2,4

**Question 19 7.5 pts**

A programming language can belong to multiple paradigms. (True/False)

***Answer:*** True

**Question 20 7.5 pts**

Logic programming languages divide the program into reasonable sized pieces named functions or modules or subroutines. (True/False)

***Answer:*** False

**Quiz 2**

**Question 1 10 pts**

What is a data type?

1. A specialized format for organizing and storing data.
2. A storage location paired with an associated symbolic name.
3. A piece of information.
4. A set of primary values and the operations defined on these values.

***Answer:*** 4

**Question 2 10 pts**

Interpretation of a program is the direct execution of one statement at a time sequentially. (True/False)

***Answer:*** True

**Question 3 10 pts**

Thy syntactic structure of imperative programming languages normally include which of the following units.

1. Operators.
2. Keywords.
3. Identifiers.
4. Conditional statements.
5. Loop statements.
6. Variable declaration.

***Answer:*** 4,5,6

**Question 4 10 pts**

What kind of error is in the following line:

int a = ((2 \* 45) \* (6 / 2) hello (4 + 90));

1. Lexical error.
2. Semantic error.
3. Syntactic error.
4. None of the above.

***Answer:*** 3

**Question 5 10 pts**

The compiler executes the program. (True/False)

***Answer:*** False

**Question 6 10 pts**

Compilation of a program is to execute all the statements of the program completely. (True/False)

***Answer:*** False

**Question 7 10 pts**

The lexical structure of all programming languages is similar and normally includes which of the following units?

1. Identifiers.
2. Loop statements.
3. Keywords.
4. Operators.
5. Literals.
6. Variable declaration.

***Answer:*** 1,3,4,5

**Question 8 10 pts**

During compilation, all statements of a program in a high-level language are converted (translated) to a low-level language (such as assembly language). (True/False)

***Answer:*** True

**Question 9 10 pts**

Functional programming languages are low-level languages. (True/False)

***Answer:*** False

**Question 10 10 pts**

The semantic structure of imperative programming languages normally include which of the following validations?

1. Type matching.
2. Division by zero.
3. A variable name should start with a letter ‘$’ or ‘\_’.
4. Parameter types in a function declaration should match these in the function call.
5. Statement should end with a ‘;’.
6. Unicity.

***Answer:*** 1,4,6

**Quiz 3**

**Question 1**

What is the output of the following code?

int foo(int \*n)

{

\*n = 30;

}

int main()

{

int i = 15;

foo(&i);

printf("i=%d\n", i);

i = 10;

foo(&i);

printf("i=%d\n", i);

return 0;

}

1. i=15

i=10

1. i=30

i=30

1. i=15

i=30

1. i=30

i=10

***Answer:*** 2

**Question 2**

Which code in C is equivalent to this code in Java?

int x = 5;

float y = 10.3f;

System.out.println(“hello “ + x + “ bye “ + y);

1. int x = 5;

float y = 10.3;

printf(“hello %d bye %f”, &x, &y);

1. int \*x = 5;

float \*y = 10.3;

printf(“hello %p bye %p”, x, y);

1. int x = 5;

float y = 10.3f;

printf(“hello %i bye %f”, x, y);

1. int x = 5;

float y = 10.3;

printf(“hello %d bye %f”, x, y);

***Answer:*** 4

**Question 3**

What does the below program print on the screen?

int main()

{

int i = 3, \*j, k;

j = &i;

printf(“%d\n”, i \* \*j \* i - \*j);

return 0;

}

1. 78
2. 24
3. 60
4. 54

***Answer:*** 2

**Question 4**

The following code is correct and prints "Hello". (True/False)

if (2 + 2 + 2 + 2)  
 if (1)  
 printf("Hello");

***Answer:*** True

**Question 5**

Which of the following are NOT primitive data types in C?

1. int
2. long
3. bool
4. char
5. double
6. short
7. float
8. string

***Answer:***

bool, string

**Question 6**

What is the output of the following program?

typedef enum week { Mon, Tue, Wed, Thur, Fri, Sat, Sun } WEEK;

int main()

{

WEEK day;

day = Wed;

printf("%d", day);

return 0;

}

1. 2
2. 3
3. 4
4. 0

***Answer:*** 2

**Question 7**

Which of the following lines prints "-15" on the screen?

int main()

{

int i = 15;

foo(&i);

printf("i=%d\n", i);

i = 10;

foo(&i);

printf("i=%d\n", i);

return 0;

}

1. int x = -15;

int \*point = &x;

printf(“%d”, \*point);

1. int x = -15;

int \*point = &x;

printf(“%d”, &x);

1. int x = -15;

int \*point = &x;

printf(“%p”, point);

1. int x = -15;

printf(“%p”, &x);

***Answer:***

1

**Question 8**

What is the output of the below code?

int fun(int n) {

if (n == 4)  
 return n;  
 else  
 return 2 \* fun(n + 1);

}

int main()

{

printf("%d", fun(3));

return 0;

}

1. 4
2. 8
3. 16
4. 32

***Answer:*** 2

**Question 9**

Given the following struct:

struct contact

{

char name[32];

int phone;

char email[32];

}

Which code can be used to create a contact and store data?

1. struct contact x;

scanf(“%s”, &x.name);

scanf(“%d”, &x.phone);

scanf(“%s”, &x.email);

1. struct contact x;

scanf(“%s”, &x.name);

scanf(“%d”, x.phone);

scanf(“%s”, &x.email);

1. struct contact x;

scanf(“%s”, x.name);

scanf(“%d”, x.phone);

scanf(“%s”, x.email);

1. struct contact x;

scanf(“%s”, x.name);

scanf(“%d”, &x.phone);

scanf(“%s”, x.email);

***Answer:*** 2

**Question 10**

What is the output of the below code?

int foo(int \*n) {

\*n = 30;

}

int main()

{

int a[5] = {3, 1, 5, 20, 25};  
 int i, j, m;  
 i = \*(a + 1) - 1;  
 j = a[1] + 1;  
 m = a[j] + a[i];  
 printf("%d,%d,%d", i, j, m);

return 0;

}

1. 0, 1, 6
2. 0, 2, 8
3. 0, 2, 5
4. 1, 2, 6

***Answer:*** 2

**Question 11**

What is the output of the below code?

int i = 10;  
  
int bar(int m, int\* n)  
{  
 printf("i=%d k=%d l=%d\n", i, m, \*n);  
}  
  
int foo(int k, int\* l)  
{  
 printf("i=%d k=%d l=%d\n", i, k, \*l);  
 k = 3;  
 \*l = 4;  
 bar(k, l);  
}  
  
int main()  
{  
 int j = 15;  
 foo2(j, &i);  
 printf("i=%d j=%d\n", i, j);  
}

1. i = 10 k = 15 l = 10

i = 10 k = 3 l = 4

i = 10 j = 15

1. i = 10 k = 15 l = 10

i = 10 k = 3 l = 10

i = 10 j = 15

1. i = 4 k = 3 l = 4

i = 4 j = 15

1. i = 10 k = 15 l = 10

i = 4 k = 3 l = 4

i = 4 j = 15

***Answer:*** 4

**Quiz 4**

**Question 1 10 pts**

The **scope resolution operator**(::) is used to overload a function or an operator in object-oriented paradigm. (True/False)

***Answer:*** False

**Question 2 10 pts**

Which of the following options is the code in C++ for

a) A class Student that inherits from a class Person.

b) A constructor in Student that calls (is able to call) a constructor in Person

* When the body of the method is not relevant to answer the question, it has been replaced for a comment **// code**

class Person {    
 public:    
  Person() { //code   
  }     
  Person(char\* lName, int year) { // code   
  }    
 private:    
  char\* lastName;    
  int yearOfBirth;    
};      
  
class Student : public Person {    
 public:    
  Student() {   
 //code   
  }     
  Student(char\* lName, int year, char\* univer) :Person(lName, year) {   
 //code  
  }    
 private:    
  char \*university;    
};

class Person {   
 public:   
 Person() {   
 //code   
 }   
 Person(char\* lName, int year) {   
 // code   
 }   
 private:   
 char\* lastName;   
 int yearOfBirth;   
};   
  
class Student extends Person {   
 public:   
 Student() {   
 //code   
 }   
 Student(char\* lName, int year, char\* univer) {  
 Person(lName, year);   
 //code  
 }   
 private:   
 char \*university;   
};

class Person {   
 public:   
 Person() {   
 //code   
 }   
 Person(char\* lName, int year) : Student (char\* lName, int year, char\* univer) {   
 // code   
 }   
 private:   
 char\* lastName;   
 int yearOfBirth;   
};   
  
class Student : public Person {   
public:   
 Student() { //code   
 }   
 Student(char\* lName, int year, char\* univer) { //code  
 }   
private:   
 char \*university;   
};

class Person {   
 public:   
 Person() {   
 //code   
 }   
 Person(char\* lName, int year) {   
 // code   
 }   
 private:   
 char\* lastName;   
 int yearOfBirth;   
};   
  
class Student : public Person {   
 public:   
 Student() {   
 //code   
 }   
 Student(char\* lName, int year, char\* univer) {  
 Person(lName, year);   
 //code  
 }   
 private:   
 char \*university;   
};

***Answer:*** 1

**Question 3 10 pts**

Given the following class definition:

class Rectangle {   
 private:   
 int width, height;   
 public:   
 void set\_values (int,int);   
 int area ();   
};

Which of the following instruction(s) create an array of 2 Rectangles and initialize them (the 2 Rectangles) with values. Select ALL the possible options.

* 1. Rectangle a[2];

a[0].set\_values(1,1);

a[1].set\_values(2,2);

Rectangle \*a[2];

* 1. a[0] = new Rectangle;

a[0]->set\_values(1,1);

a[1] = new Rectangle;

a[1]->set\_values(2,2);

* 1. Rectangle \*a = new Rectangle[2];

a[0]->set\_values(1,1);

a[1]->set\_values(2,2);

* 1. Rectangle a = new Rectangle[2];

a[0].set\_values(1,1);

a[1].set\_values(2,2);

***Answer:*** 1,2

**Question 4 10 pts**

Which of the following classes creates and initializes correctly an static variable in C++?

1. class Something {

public:

static int v;

};

Something::v = 1;

1. class Something {

public:

static int v;

};

int Something::v = 1;

1. class Something {

public:

static int v;

};

int v = 1;

1. class Something {

public:

static int v;

};

v = 1;

***Answer:*** 2

**Question 5 10 pts**

Running the following program.

How many times will the message "good bye!" be printed on the screen?

#include<iostream>  
using namespace std;  
class CSE {  
 public:  
 CSE(int v) {  
 cout<<"constructor\n";  
 }  
 void add(int v) {   
 cout<<"adding\n";  
 }  
 int remove(){  
 cout<<"removing\n";  
 return 0;  
 }  
 ~CSE() {  
 cout<<"good bye!\n";  
 }  
};  
int main(){  
 CSE q1(5);  
 CSE \*q2 = new CSE(5);  
 q1.add(2);  
 q1.add(8);  
 q1.remove();  
 q2->remove();  
 delete q2;  
 return 0;  
}

***Answer:*** 2

**Question 6 10 pts**

In the following code, how many times the destructor of the class "**Base**" is executed?

#include<iostream>  
using namespace std;  
class Base {  
 public:  
 Base(int n) {  
 cout<<"Base Constructor\n";  
 }  
 void function() {  
 cout<<"function\n";  
 }  
 ~Base() {  
 cout<<"Base destructor\n";   
 }  
};  
  
class Derived : public Base {  
 public:  
 Derived(int n) : Base(n) {  
 cout<<"Derived Constructor\n";  
 }  
 ~Derived() {  
 cout<<"Derived destructor\n";  
 }  
};  
  
int main(){  
 Derived myPQ1(50);  
 myPQ1.function();  
 Derived \*myPQ2 = new Derived(50);  
 myPQ2->function();  
 delete myPQ2;  
 return 0;  
}

***Answer:*** 2

**Question 7 10 pts**

The principle behind the object-oriented paradigm consists of a number of programming concepts, which **does not** include the following:

1. Classes.
2. Polymorphism.
3. Pointers.
4. Arrays.
5. Inheritance.

***Answer:*** 3,4

**Question 8 10 pts**

The following declaration allows all elements in the standard C++ library to be accessed in an unqualified manner (without the std:: prefix)

1. #include <iostream.h>
2. using namespace iostream;
3. using namespace std;
4. #include <iostream>

***Answer:*** 3

**Question 9 10 pts**

In C++, implementations of member functions cannot be inside the class definition (for short functions) or outside of the class definition. (True/False)

***Answer:*** False

**Question 10 10 pts**

Which lines in C++ are equivalent to this code in Java

int x = 5;  
char a = 'A';  
System.out.print( "Hello " + x + ", " + a );

1. int x =5;

char a = 'A;

cout << "Hello %d, %c" << x << a;

1. int x =5;

char a = 'A';

cout >> "Hello " >> x >> ", " >> a;

1. int x =5;

char a = 'A';

cout << "Hello " << x << ", " << a;

1. int x =5;

char a = 'A';

cout ("Hello %d, %c", x, a);

***Answer:*** 3

**Quiz Before Midterm** *(some questions are mentioned in previous quizzes thus excluded)*

**Question 3 0.5 pts**

This programming language uses two-step translation with intermediate codes for execution.

1. C#
2. Java
3. C++
4. LISP
5. C

***Answer:*** 2

**Question 6 0.5 pts**

Considering the following code

struct emp {  
    int id;  
    char \*name;  
};  
struct emp john;

Which of the following lines are correct?

int a = 1;  
char b[ ] = "John Doe";  
john.id = b;  
john.name = a;  
printf ("%d, %s", john.id, john.name);

int a = 1;  
char b[ ] = "John Doe";  
john[0].id = a;  
john[0].name = b;  
printf ("%d, %s", john[0].id, john[0].name);

1. .

int a = 1;  
char b[ ] = "John Doe";  
emp.id = a;  
emp.name = b;  
printf ("%d, %s", emp.id, emp.name);

1. .

int a = 1;  
char b[ ] = "John Doe";  
john.id = a;  
john.name = b;  
printf ("%d, %s", john.id, john.name);

***Answer:*** 4

**Question 7 0.5 pts**

Which of the following programs are correct in C? (select all that apply)

1. typedef int booOoolean;

typedef char FlagType;

int main()

{

booOoolean x = 0;

int counter; FlagType xx = 'A'; // comment

}

1. typedef enum { false, true } booOoolean;

typedef enum { Sun, Mon, Tue, Wed, Thu, Fri, Sat } days;

int main()

{

booOoolean a = false;

int counter; days x = Mon, y = Fri;

while (x != y) x++;

}

1. typedef enum { red, amber, green } traffic\_light;

int main()

{

traffic\_light x = red;

while (1)

switch (x)

{

case amber: x = red; printf("R"); break;

case red: x = green; printf("G"); break;

case green: x = amber; printf("A"); break;

}

}

***Answer:*** 1,2,3

**Question 8 0.5 pts**

Which of the followings are correct declarations of the main() method (i.e., the entry point of a program)?

1. int main()

{

return 0;

}

1. public static void main(String[] argv)

{

}

1. void main()

{

}

1. void main(int argc, char \*argv[])

{

}

1. int main(int argc, char \*argv[])

{

return 0;

}

1. main()

{

return 0;

}

***Answer:*** 1,3,4,5,6

**Question 10 0.5 pts**

In C, when you pass an array as a parameter to a function, what is actually passed?

1. All the values in array
2. The value of the first element in the array.
3. The address of the first element in the array
4. An array cannot be passed as a parameter to a function.

***Answer:*** 3

**Quiz Midterm**

**Question 1 7 pts**

What is the output of the following codes?

#include <stdio.h>  
int main()

{  
 char s1[] = "hello";

printf("%s\n", s1);

for (int i = 0; i < 5; i++)

printf("%c", s1[i]);

printf("\n");

return 0;  
}

***Answer:***

hello

hello

#include <stdio.h>  
int main()

{  
 int x = 5;

int \*y;

y = &x;

printf("value of x: %d \n", x);

printf("address of x: %p \n", &x);

printf("value of y: %p \n", y);

printf("value pointed by y: %d \n", \*y);

return 0;  
}

***Answer:***

value of x: 5

address of x: 00000017893ff994

value of y: 00000017893ff994

value pointed by y: 5

#include <stdio.h>  
void fun(int x)

{

if (x > 0) {

printf("%d", x);

code3(x - 1);

printf("%d", x);

}

int main()

{  
 fun(2);

return 0;  
}

***Answer:***

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#include <iostream>

using namespace std;

class Queue {  
public:  
 Queue();  
  
 Queue(int n);  
  
 ~Queue();  
};  
  
Queue::Queue() {  
 cout << "constructor (void)" << endl;  
}  
  
Queue::Queue(int n) {  
 cout << "constructor (int)" << endl;  
}  
  
Queue::~Queue() {  
 cout << "destructor" << endl;  
}

int main()  
{  
 Queue myQueue1(500);  
 Queue myQueue2;  
 return 0;  
}

***Answer:***

constructor (int)

constructor (void)

destructor

destructor

**Question 2 3 pts**

Write a C++ class (named Student)

int main()

{  
 Student s(2, "John", 100); //Creating an object passing values for id,name,grade

s.display(); // Displaying Student attributes (id, name, and grade)

return 0;  
}

***Answer:***

class Student  
{  
public:  
 int id;  
 string name;  
 int grade;  
  
 Student(int i, string n, int g);  
  
 void display();  
};  
  
Student::Student(int i, string n, int g)  
{  
 id = i;  
 name = n;  
 grade = g;  
}  
  
void Student::display()  
{  
 cout << "id = " << id << endl;  
 cout << "name = " << name << endl;  
 cout << "grade = " << grade << endl;  
}

**Quiz 5**

**Question 1 10 pts**

Which of the following lines (in Java, C, or C++) is equivalent to this expression in LISP?

(- (\* 1 2) (+ 3 4) (/ 5 6) 7 )

(1 \* 2) - (3 + 4) - (5 / 6) – 7

1 - 2 \* 3 - 4 / 5 - 6 - 7

(1- 2) + (3 \* 4) / (5 \* 6) - 7

(1 - 2) \* (3 - 4) \* (5 - 6) / 7

***Answer:***

1

**Question 2 10 pts**

Which of the following lines represent in LISP the operation of 3 multiplied by 4?

(multiply 3 4)

(3 \* 4)

3 \* 4

(\* 3 4)

***Answer:***

4

**Question 3 10 pts**

What is the value returned for the following LISP expression?

(+ 1   (if (< 2 1) (\* 3 3)    6  ) )

***Answer:***

7

**Question 4 10 pts**

One feature of the functional paradigm is a higher level of abstraction compared with Imperative and Object-Oriented paradigms. (True/False)

***Answer:*** True

**Question 5 10 pts**

What is the last value printed on the screen after running the following  LISP code?

(setf num 1)

(dotimes (x 3) (setf num (+ num num) ) )

(print num)

***Answer:***

8

**Question 6 10 pts**

functions are created by calling a function-making macro. This macro is called:

1. progn
2. let
3. defun
4. function

***Answer:*** 3

**Question 7 10 pts**

What is equivalent code in C++ for the following LISP statement:

(if (< 1 2) (\* 3 4) (/ 5 6) )

if (1 < 2) return 3 \* 4; else return 5 / 6;

if (1 < 2) { cout<< 3 \* 4; return 5 / 6; }

if (1 < 2) cout<< 3 \* 4; else cout << 5 / 6;

if (1 < 2) { cout<< 3 \* 4; cout << 5 / 6; }

***Answer:***

1

**Question 8 10 pts**

What is printed by the print instruction in the second line?

(setf theList '(2 3 7 9 10) )

(print (first ( rest theList ) ) )

3

7

2

(3)

(2)

***Answer:***

1

**Question 9 10 pts**

What is printed on the screen by the print instruction in the code below?

(print

( and

(< (\* 3 5 ) )

( not (>= 4 6 ) )

)

)

***Answer:***

T

**Question 10 10 pts**

Is the following line correct in LISP? (True/False)

( + 1 2 3 4 5 6 7 8 9 0)

***Answer:*** True

**Quiz 6**

**Question 1 10 pts**

Logic programming describes what the problem is by a set of conditions and constraints, and leaves the computer to match the problem to the existing knowledge of facts and rules and to find solutions to the problem. (True/False)

***Answer:*** True

**Question 2 10 pts**

Which rules in Prolog match the following definition of a bad dog:

*A dog is bad if it bites the postman, chews the newspaper, or chases the cat.*

is\_dog(Dog), bites(Dog, Postman),is\_postman(Postman):-bad\_dog(Dog).

is\_dog(Dog), chews(Dog, Newspaper),is\_newspaper(Newspaper):-bad\_dog(Dog).

is\_dog(Dog), chases(Dog, Cat), is\_cat(Cat):-bad\_dog(Dog).

bad\_dog(Dog) :- is\_dog(Dog); bites(Postman); is\_postman(Postman).

bad\_dog(Dog) :- is\_dog(Dog); chews(Newspaper); is\_newspaper(Newspaper).

bad\_dog(Dog) :- is\_dog(Dog); chases(Cat); is\_cat(Cat).

bad\_dog(Dog) :- is\_dog(Dog), bites(Dog, Postman), is\_postman(Postman).

bad\_dog(Dog) :- is\_dog(Dog), chews(Dog, Newspaper), is\_newspaper(Newspaper).

bad\_dog(Dog) :- is\_dog(Dog), chases(Dog, Cat), is\_cat(Cat).

bad\_dog(Dog) :- is\_dog(Dog); bites(Postman).

bad\_dog(Dog) :- is\_dog(Dog); chews(Newspaper).

bad\_dog(Dog) :- is\_dog(Dog); chases(Cat).

***Answer:*** 3

**Question 3 10 pts**

?- 10 + 5 is 15.

How will prolog respond to this query? (True/False)

***Answer:***

False

**Question 4 10 pts**

Do these two different queries produce the same result in prolog? (True/False)

?- N is -(+(1,2),3).

?- N is (1+2)-3.

***Answer:*** True

**Question 5 10 pts**

Given the following fact and rule.

(some extra white-spaces has been added to facilitate reading)

fun(1, 2).

fun(N, F) :- N>0, N1 is N - 1, fun(N1, F1), F is N \* F1.

What is the value of the variable X after running the following query?

?- fun (4,X).

***Answer:***

48

**Question 6 10 pts**

Which rule defines in Prolog the following sentence:

*"mary owns a Pet if it is a cat and it has black spots"*

owns(mary, Pet):- cat(Pet), black\_spots(Pet).

cat(Pet), black\_spots(Pet):-owns(mary, Pet).

mary(owns, Pet):- cat(Pet), black\_spots(Pet).

owns(mary, Pet):- cat(Pet); black\_spots(Pet).

***Answer:***

1

**Question 7 10 pts**

Which of the following rules defines

*" if X is instructor of the course C and Y is enrolled in the course C then X teaches Y"*

teaches(P,S) :- instructor(P,C), enrolled(S,C).

instructor(P,C), enrolled(S,C) :-teaches(P,S).

instructor(P,C); enrolled(S,C) :-teaches(P,S).

teaches(P,S) :- instructor(P,C); enrolled(S,C).

***Answer:***

1

**Question 8 10 pts**

Which rule defines in Prolog the following sentence:

*"If someone owns something, he loves it"*

loves(Who, What):-owns(Who, What).

owns(Who, What):-loves(Who, What).

owns(Who, What), loves(Who, What).

loves(Who, What). owns(Who, What).

loves(Who, What); owns(Who, What).

***Answer:***

1

**Question 9 10 pts**

Write in Prolog the question *"Which food is meal and lunch?"*

meal(X), lunch(X).

meal(X). lunch(X).

meal(X):- lunch(X).

meal(X); lunch(X).

***Answer:*** 1

**Question 10 10 pts**

Given the following fact and rule.

(some extra white-spaces has been added to facilitate reading)

fun(1, 2).

fun(N, F) :- N>0, N1 is N - 1, fun(N1, F1), F is N \* F1.

What is the value of the variable X after running the following query?

?- fun (1,2).

1. True
2. False

***Answer:*** 1