

Special Quiz (November 24, 2020)

Total points 10/15 ?

Write your name and ID correctly.

There are 15 questions in this quiz. Each question carries 1 mark. The total time duration for the quiz is 15 minutes. Answer the questions and submit your responses.

The respondent's email address (**f20181119@pilani.bits-pilani.ac.in**) was recorded on submission of this form.

0 of 0 points

Name *

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Questions 1-15

10 of 15 points

We use combinators for computations in lambda calculus. Name the combinator that is best used to emulate recursion. (You are not expected to write the expression).

1/1

Y combinator

Feedback

All answers with Y are considered.



Consider the array element access at lines 1 and 2. When is the (a) type and (b) bound checking of expression at line 1 done? When is the (c) type and (d) bound checking of expression at line 2 done? 1/1

```
#include<stdio.h>
int main()
{
    int A[]={1,2,3,4,5,6,7,8,9};
    int x;
    x = A[6]; //Line 1
    x = x + A[x]; //Line 2
    return 0;
}
```

- ☒ (a) Compile time (b) Compile time (c) Compile time (d) Run time
- ☐ (a) Run time (b) Compile time (c) Run time (d) Compile time
- ☐ (a) Compile time (b) Compile time (c) Run time (d) Run time
- ☐ (a) Compile time (b) Run time (c) Compile time (d) Run time
- ☐ None of these
- ☐ (a) Run time (b) Compile time (c) Run time (d) Run time

Logic programming deals with

1/1

- ☒ relations
- ☐ None of these
- ☐ functions
- ☐ state of the program



Consider the following program written in Prolog. What is the output of the query `mother(anna, X)`? 1/1

```
mother(anna, john).  
mother(anna, eric).  
father(tom, john).  
father(tom, eric).  
father(mike, tom).  
sibling(X,Y) :- parent(Z,X), parent(Z,Y).  
grandfather(X,Y) :- father(X,Z), father(Z,Y).  
parent(X,Y) :- father(X,Y).  
parent(X,Y) :- mother(X,Y).
```

- ☐ X = eric
- ☒ X = john ; X = eric
- ☐ X = john
- ☐ X = parent(anna, john)
- ☐ None of these



Consider the following C program which uses static scoping for its non-local 0/1 variables. What is the output of the program?

```
#include<stdio.h>
int main() {
    int a = 4, b = -10;
    int c=-5;
    {
        int c = 17;
        c = 3*a-b+c;
        printf(" %d", c);
        {
            int a = -19;
            c = 3*a-b+c;
            printf(" %d", c);
        }
        c = 3*a-b+c;
        printf(" %d", c);
    }
    c = 3*a-b+c;
    printf(" %d", c);
    return 0;
}
```

- ☒ 39 -8 61 17
- ☐ 39 -8 14 17
- ☐ 39 9 14 17
- ☐ None of these

Correct answer

- ☒ 39 -8 14 17



Consider the following C-like code. If size of an integer is 4 bytes and that of a0/1 floating point number is 8 bytes, then what is the offset of V.B.y?

```
int main(){
    struct node{
        int x;
        float y;
    };
    union new{
        struct node A;
        struct node B;
        float C;
    } ;
    struct node P, Q, R;
    union new U, V;
}
```

Correct answer

52

(Statement 1): Java provides features for the dynamically programmed to define primitive data types. However, internally they are converted to objects through autoboxing. (Statement 2) :One of the main pillars of object oriented programming is dynamic method dispatch. In java all objects and methods are dynamically bound. There is no provision for static binding in Java. 1/1

- ☐ Both the statements are correct
- ☒ Only statement 1 is correct
- ☐ Both the statements are wrong
- ☐ Only statement 2 is correct



The efficiency of C++ is higher than Small talk in terms of execution of programs. Why? Choose the most appropriate option. 0/1

- ☐ C++ supports features that utilize the features by processor for faster computations of results
- ☐ Both the statements are wrong.
- ☐ Both the statements are correct
- ☒ C++ supports static type checking. The programmer has been given the authority to choose between static binding and dynamic binding.amic

Correct answer

- ☒ Both the statements are correct



Consider the following C code. If the size of an integer is 4 bytes, then which 1/1 of the following statements is correct with reference to the execution flow being at line 1?

```
#include<stdio.h>
#include<stdlib.h>
int main(){
    int *p, *q, *r, x=56;
    p = (int *) malloc(sizeof(int)*38);
    x=x+5;
    p[10]=x-30;
    q = (int *) malloc(sizeof(int)*79);
    p=q;
    q[20]=p[10]+3;
    r = (int *) malloc(sizeof(int)*46);
    q=r;
    r[18]= p[20];
    free(q);
    //Line 1
    return 0;
}
```

- ☒ The memory leak is of size 152 bytes and the pointer r is the dangling pointer.
- ☐ The memory leak is of size 468 bytes and the pointer p is the dangling pointer.
- ☐ The memory leak is of size 184 bytes and the pointer r is the dangling pointer.
- ☐ The memory leak is of size 152 bytes and the pointer p is the dangling pointer.
- ☐ The memory leak is of size 316 bytes and the pointer q is the dangling pointer.
- ☐ None of these
- ☐ The memory leak is of size 316 bytes and the pointer r is the dangling pointer.



Which of the statements given are correct in reference to the logic programming paradigm? (1) The language is declarative (2) A program comprises of facts and rules (3) Program has loops and conditional statements (4) The meaning of a proposition depends on the execution sequence of the program (5) The input to the program is a query (6) The input to the program are facts and rules

1/1

- ☐ Statements 1, 2 and 4
- ☐ Statements 1, 2 and 3
- ☐ Statements 3, 4 and 6
- ☒ Statements 1, 2 and 5
- ☐ None of these
- ☐ Statements 2, 3 and 4

A control link points to

1/1

- ☐ the activation tree displaying the execution flow across the functions
- ☐ the activation record of the callee function
- ☒ the activation record of the caller function
- ☐ none of these
- ☐ the top of the call stack



The nonlocal variables in nested functions that use static scope

0/1

- ☐ None of these
- ☐ are implemented using control links to the activation record of the caller function whose code text has the variable declarations
- ☒ are implemented using access links pointing to the code of their static parent whose code has the variable declarations.
- ☐ are implemented using access links pointing to the activation record of the function whose code text has the variable declarations.
- ☐ are implemented using control links to the code of their static parent whose code text has the variable declarations

Correct answer

- ☒ are implemented using access links pointing to the activation record of the function whose code text has the variable declarations.

(stmt 1.) lambda calculus can only be used to solve classical problems. It can not support object oriented features like polymorphism. (Stmt 2) Languages including C++ don't support the pure object oriented notion for objects. It supports primitive data types which are not objects in C++.

1/1

- ☐ Both statements are wrong
- ☐ Both statements are true
- ☐ Only statement 1 is correct
- ☒ Only statement 2 is correct



What will be the output of following expression in Haskell? `head (head (tail [1,2,3,4,5]))` 0/1

2

Correct answers

Error

run-time error

error

ERROR

Error!

syntax error

Syntax Error

Type error

Returns error

Incorrect expression

Error (head does not take int)

Error: head() not defined for single element

Error because head only takes a list

head(2)=E

error (because head returns value not a list)

Type error (head takes array; inner head gives int)

ERROR because head expects list as an argument.

Error, because head can only be done on a list

Error. The head function can be applied only to a list, while head(tail(list)) returns an element

error as head expects a list but here the input is int

error as outermost head expects a list and gets an integer value 2 as input

this will result in an error. head(X) returns an element of the list, head() cannot be applied again

Not applicable



not applicable

Feedback

All answers specifying the error are considered as correct.

The type checking for a union type variable in C language is done at run time 1/1

- ☐ None of these
- ☐ if the first time usage of the variable field in the program is maintained using a separate variable value and accessed using the corresponding value
- ☒ if every usage of the variable field is maintained using a separate variable value other than the union variable and accessed using the corresponding value
- ☐ if every usage of the variable field is maintained using value of another field of the same record variable and is accessed using the corresponding value

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