

Problem for Challenge 2 (1st year)

1. Find the output of the below code.

```
int main() {
    int a = printf("NITAP");
    printf("%d", a);
    return 0;
}
```

- a) Compilation error b) NITAP c) NITAP5 d) Garbage value

Correct option - c) NITAP5

2. While writing a C code, we usually include header files at the top of each program. The files are executed by which of the following.

- a) Loader b) Pre-processor c) Compiler d) Header and metadata instance

Correct option - b) Pre-processor

3. What is the output of the following code.

```
int main() {
    int _ = 10;
    int __ = 20;
    int ___ = _ + __;
    printf(" ___%d", ___);
    return 0;
}
```

- a) Runtime error b) __0 c) __30 d) ___+__

Correct option - c) __30

4. What will be the output of the given C program.

```
int main() {
    char arr[15] = "NIT Arunachal Pradesh";
    printf("%s", arr);
    return 0;
}
```

- a) NIT Arunachal Pradesh b) NIT Arunachal c) Compilation error d) NIT Arunachal '\0'

Correct option - c) Compilation error

5. How many times Coding is printed?

```
int main() {
    int a = 0;
    while (a++ < 5-++a) printf("Coding");
    return 0;
}
```

- a) 4 b) 3 c) 2 d) 1

Correct option - d) 1

6. How many times Coding is printed?

```
int main() {  
    int a = 0;  
    while (a++ < 5) printf("Coding");  
    return 0;  
}
```

- a) 5 b) 4 c) 3 d) 2

Correct option - a) 5

7. What will be the output of the following code.

```
int main() {  
    int a = 0;  
    while (a++) printf("Repeated 1000 times");  
    return 0;  
}
```

- a) Repeated 1000 times b) Infinite times c) No output d) Runtime error

Correct option - c) No output

8. How many times will the statement be printed?

```
int main() {  
    int a = 0;  
    while (a++);  
    {  
        printf("Executed");  
    }  
    return 0;  
}
```

- a) 0 time b) 1 time c) Compilation error d) Infinite times

Correct option - b) 1 time

9. What is the meaning of the below line in C?

```
void sum (int, int);
```

- a) sum is a function taking two integers as an argument
b) Compilation error as integers are not defined
c) Sum is a function taking two int arguments and returning an integer value
d) Sum is a function taking two int arguments and returning nothing

Correct option - d) sum is a function taking two int arguments and returning nothing

10. What is the storage class for variable A in below code.

```
int main() {
    float A = 10.000000;
    printf("%d", &A);
    return 0;
}
```

- a) Extern b) auto c) register d) static

Correct option - b) auto

11. What is the output of the following program.

```
#include "stdio.h"
int main() {
    int a = 10;
    printf("%d", a);
    int a = 20;
    printf("%d", a);
    return 0;
}
```

- a) 1020
 b) 1010
 c) Error: used " " instead of < > while declaring header file
 d) error: other reason

Correct option - d) error : other reason

12. What will be the output of the following code.

```
#include "stdio.h"
int main() {
    int a = 10, b = 20;
    if (a = b) printf("Easy");
    else printf("Hard");
    return 0;
}
```

- a) Easy b) Hard c) EasyHard d) error in program

Correct option - a) Easy

13. Will compiler produce any compilation error if same header file is included twice?

- a) Yes b) No c) may or may not be, that depends on the code d) uncertain about the answer

Correct option - b) No

14. What is the extension of output file produced by preprocessor?

- a) .h b) .exe c) .i d) .asm

Correct option - c) .i

15. Is it possible to return values by any function twice?

- a) Yes
- b) No
- c) may or may not be, depending upon the structure of the code
- d) uncertain about the answer

Correct option - b) No

Programming Question

1. Write a program to find the sum of left diagonals of a matrix.

Problem for Challenge 2 (2nd year)

1. Find the output of the below code.

```
int main() {  
    extern int i;  
    i = 20;  
    printf("%d", sizeof(i));  
    return 0;  
}
```

- a) 20 b) 0 c) undefined reference to i d) linking error

Correct option - c) undefined reference to i

2. Find the output of the below mentioned code.

```
int main() {  
    int a = 320;  
    char *ptr;  
    ptr = (char *)&a;  
    printf("%d", *ptr);  
    return 0;  
}
```

- a) 320 b) 60 c) 160 d) 64

Correct option - d) 64

3. How many times will the statement be printed?

```
int main() {  
    int a = 0;  
    while (++a++);  
    {  
        printf("Compiled");  
    }  
    return 0;  
}
```

- a) 1 time b) 0 time c) Infinite time d) error

Correct option - d) error

4. The concept of two functions with same name is known as _____

- a) Operator overloading b) Function overloading c) Function overriding d) Function renaming

Correct option - b) Function overloading

5. What is the output of the below code?

```
int main() {
    char name[] = "Computer";
    int len;
    int size;
    len = strlen(name);
    size = size_of(name);
    printf("%d, %d", len, size);
    return 0;
}
```

- a) 6, 6 b) 6, 7 c) 7, 7 d) 0, 0

Correct option - b) 6, 7

6. Select the function which performs insertion at the front end of the dequeue?

```
a) public void function(Object item)
{
    Node temp = new Node(item,null);
    if(isEmpty())
    {
        temp.setNext(trail);
        head.setNext(temp);
    }
    else
    {
        Node cur = head.getNext();
        temp.setNext(cur);
        head.setNext(temp);
    }
    size++;
}
```

```
b) public void function(Object item)
{
    Node temp = new Node(item,null);
    if(isEmpty())
    {
        temp.setNext(trail);
        head.setNext(trail);
    }
    else
    {
        Node cur = head.getNext();
        temp.setNext(cur);
        head.setNext(temp);
    }
}
```

```
        size++;
    }
```

```
c) public void function(Object item)
{
    Node temp = new Node(item,null);
    if(isEmpty())
    {
        Node cur = head.getNext();
        temp.setNext(cur);
        head.setNext(temp);
    }
    else
    {
        temp.setNext(trail);
        head.setNext(temp);
    }
    size++;
}
```

```
d) public void function(Object item)
{
    Node temp = new Node(item,null);
    if(isEmpty())
    {
        Node cur = head.getNext();
        temp.setNext(cur);
        cur.setNext(temp);
    }
    else
    {
        head.setNext(trail);
        trail.setNext(temp);
    }
    size++;
}
```

Correct option - a) public void function(Object item)

```
{
    Node temp = new Node(item,null);
    if(isEmpty())
    {
        temp.setNext(trail);
        head.setNext(temp);
    }
    else
    {
        Node cur = head.getNext();
        temp.setNext(cur);
        head.setNext(temp);
    }
    size++;
}
```

7. What is the time complexity of deleting from the rear end of the dequeue implemented with a singly linked list?

- a) $O(n \log n)$ b) $O(\log n)$ c) $O(n)$ d) $O(n^2)$

Correct option - c) $O(n)$

8. Which of the following application makes use of a circular linked list?

- a) Undo operation in a text editor
- b) Recursive function calls
- c) Allocating CPU to resources
- d) Implement Hash Tables

Correct option - c) Allocating CPU to resources

9. What is the functionality of the following code? Choose the most appropriate answer.

```
public int function(){
    if (head == null)
        return Integer.MIN_VALUE;
    int var;
    Node temp = head;
    while (temp.getNext() != head)
        temp = temp.getNext();
    if (temp == head){
        var = head.getItem();
        head = null;
        return var;
    }
    temp.setNext(head.getNext());
    var = head.getItem();
    head = head.getNext();
    return var;
}
```

- a) Return data from the end of the list
- b) Returns the data and deletes the node at the end of the list
- c) Returns the data from the beginning of the list
- d) Returns the data and deletes the node from the beginning of the list

Correct option - d) Returns the data and deletes the node from the beginning of the list

10. Which data structure can be used to test a palindrome?

- a) Tree
- b) Heap
- c) Stack
- d) Priority Queue

Correct option - c) Stack

11. Select the appropriate code which tests for a palindrome.

```
a) public static void main(String[] args)
{
    System.out.print("Enter any string:");
    Scanner in=new Scanner(System.in);
    String input = in.nextLine();
    Stack<Character> stk = new Stack<Character>();
    for (int i = 0; i < input.length(); i++)
    {
        stk.push(input.charAt(i));
    }
    String reverse = "";
    while (!stk.isEmpty())
    {
```

```

        reverse = reverse + stk.pop();
    }
    if (input.equals(reverse))
        System.out.println("palindrome");
    else
        System.out.println("not a palindrome");
}

```

b) public static void main(String[] args)

```

{
    System.out.print("Enter any string:");
    Scanner in=new Scanner(System.in);
    String input = in.nextLine();
    Stack<Character> stk = new Stack<Character>();
    for (int i = 0; i < input.length(); i++)
    {
        stk.push(input.charAt(i));
    }
    String reverse = "";
    while (!stk.isEmpty())
    {
        reverse = reverse + stk.peek();
    }
    if (input.equals(reverse))
        System.out.println("palindrome");
    else
        System.out.println("not a palindrome");
}

```

c) public static void main(String[] args)

```

{
    System.out.print("Enter any string:");
    Scanner in=new Scanner(System.in);
    String input = in.nextLine();
    Stack<Character> stk = new Stack<Character>();
    for (int i = 0; i < input.length(); i++)
    {
        stk.push(input.charAt(i));
    }
    String reverse = "";
    while (!stk.isEmpty())
    {
        reverse = reverse + stk.pop();
        stk.pop();
    }
    if (input.equals(reverse))
        System.out.println("palindrome");
    else
        System.out.println("not a palindrome");
}

```

d) public static void main(String[] args)

```

{
    System.out.print("Enter any string:");
    Scanner in=new Scanner(System.in);
    String input = in.nextLine();
    Stack<Character> stk = new Stack<Character>();
    for (int i = 0; i < input.length(); i++)
    {
        stk.push(input.charAt(i));
    }
}

```



```

String reverse = "";
while (!stk.isEmpty())
{
    reverse = reverse + stk.pop();
    stk.pop();
}
if (!input.equals(reverse))
    System.out.println("palindrome");
else
    System.out.println("not a palindrome");
}

```

Correct option - a) public static void main(String[] args)

```

{
    System.out.print("Enter any string:");
    Scanner in=new Scanner(System.in);
    String input = in.nextLine();
    Stack<Character> stk = new Stack<Character>();
    for (int i = 0; i < input.length(); i++)
    {
        stk.push(input.charAt(i));
    }
    String reverse = "";
    while (!stk.isEmpty())
    {
        reverse = reverse + stk.pop();
    }
    if (input.equals(reverse))
        System.out.println("palindrome");
    else
        System.out.println("not a palindrome");
}

```

12. Which of the following tree data structures is not a balanced binary tree?

- a) AVL tree b) Red-black tree c) Splay tree d) B-tree

Correct option - d) B-tree

13. Balanced binary tree with n items allows the lookup of an item in _____ worst-case time.

- a) $O(\log n)$ b) $O(n \log 2)$ c) $O(n)$ d) $O(1)$

Correct option - a) $O(\log n)$

14. What is the maximum number of possible non zero values in an adjacency matrix of a simple graph with n vertices?

- a) $(n*(n-1))/2$ b) $(n*(n+1))/2$ c) $n*(n-1)$ d) $n*(n+1)$

Correct option - c) $n*(n-1)$

15. Which of these adjacency matrices represents a simple graph?

- a) $[[1, 0, 0], [0, 1, 0], [0, 1, 1]]$
b) $[[1, 1, 1], [1, 1, 1], [1, 1, 1]]$
c) $[[0, 0, 1], [0, 0, 0], [0, 0, 1]]$
d) $[[0, 0, 1], [1, 0, 1], [1, 0, 0]]$

Correct option - d) [[0, 0, 1], [1, 0, 1], [1, 0, 0]]

16. If we try to add Enum constants to a TreeSet, what sorting order will it use?

- a) Sorted in the order of declaration of Enums
- b) Sorted in alphabetical order of Enums
- c) Sorted based on order() method
- d) Sorted in descending order of names of Enums

Correct option - a) Sorted in order of declaration of Enums

17. A stack-organised computer uses instruction of _____

- a) Indirect addressing
- b) Two addressing
- c) Zero addressing
- d) Index addressing

Correct option - c) Zero addressing

18. The difference between memory and storage is that the memory is _____ and storage is _____

- a) Temporary, permanent
- b) permanent, temporary
- c) slow, fast
- d) none of the above

Correct option - a) Temporary, permanent

19. Indicate which of the following, best describes the term "software".

- a) System programs only
- b) application programs only
- c) both a) and b)
- d) none of the above

Correct option - a) system programs only

20. Given the language $L = \{ab, aa, baa\}$, which of the following strings are in L^* ?

- 1. abaabaaabaa
- 2. aaaabaaaa
- 3. baaaaabaaaab
- 4. baaaaabaa

- a) 1, 2, 3
- b) 2, 3, 4
- c) 1, 2, 4
- d) 1, 3, 4

Correct option - c) 1, 2, 4

21. Which one of the following is true?

- a) The language $L = \{a^n b^n \mid n > 0\}$ is regular.
- b) The language $L = \{a^n \mid n \text{ is prime}\}$ is regular.
- c) The language $L = \{w \mid w \text{ has } 3k+1 \text{ b's for some } k\}$ is regular.
- d) None of these

Correct option - c) The language $L = \{w \mid w \text{ has } 3k+1 \text{ b's for some } k\}$ is regular.

22. Which of the following is not an example of system software?

- a) Language translator
- b) Utility software
- c) Communication software
- d) Word Processors

Correct option - d) Word Processors

23. OSS stands for:

- a) Open System Service
- b) Open Source Software
- c) Open System Software
- d) Open Synchronized Software

Correct option - b) Open Source Software

24. They normally interact with the system via user interface provided by the application software.

- a) Programmers
- b) Developers
- c) Users
- d) Testers

Correct option - c) Users

25. Which of the following is not a feature of compiler?

- a) Execution time is more
- b) When all the syntax errors are removed execution takes place
- c) Scans the entire program first and then translate it into machine code
- d) Slow for debugging

Correct option - a) Execution time is more

Programming Question

1. Ravi was writing code in python. While he was writing a code he was interrupted by one of his friend. After interruption, he forgot how many braces he had already placed in his code. Being a computer Science Engineer, he wants to correct this mistake as soon as possible. But the feeded string was very large and it is impossible to omit and rewrite it again. He is asking you for help.

Can you help him by doing his work easier?