JB Academy, Ayodhya
Annual Examination 2023-24
Class XI, Sub: Computer Science

Time Allowed: 3:00 Hrs MM-70

Section-A (Each question carries one mark)

1. What is the purpose of the **replace()** method of string in Python**?**
   a) Remove a character from the string
   b) Replace a substring with another substring
   c) Concatenate two strings
   d) Convert the string to lowercase

2. What is the purpose of the **count()** method in tuples?

   a) Counts the occurrences of a specific element in the tuple
   b) Counts the total number of elements in the tuple
   c) Counts the number of distinct elements in the tuple
   d) Counts the occurrences of a specific substring in the tuple

3. What will the output of **len([1, [2, 3], 4])** be?
   a) 2 b) 3 c) 4 d) 5

4. What is the purpose of the **index()** method in a list?

   a) Returns the index of the first occurrence of a value
   b) Returns the index of the last occurrence of a value
   c) Returns the total number of elements in the list
   d) Returns the index of a specified element

5. What does the **sort()** method do in Python lists?

   a) Reverses the order of elements in the list
   b) Sorts the elements in ascending order
   c) Sorts the elements in descending order
   d) Removes all elements from the list

6. In a dictionary, what does the **setdefault()** method do?

   a) Sets the value of a key if the key is present, otherwise adds the key with a default value
   b) Removes a key from the dictionary
   c) Returns the value of a key if the key is present, otherwise returns None
   d) Creates a new dictionary with the specified key-value pair

7. Which method is used to remove a key-value pair from a dictionary in Python?

   a) dictionary.remove(key) b) dictionary.delete(key)

   c) dictionary.pop(key) d) dictionary.discard(key)

8. What does the **dict.fromkeys(keys, value)** method do in Python?

   a) Creates a new dictionary with keys and values specified in the arguments.
   b) Creates a new dictionary with keys from a list and a default value.

c) Creates a new dictionary with values from a list and default keys.
d) Modifies an existing dictionary by setting values for specified keys.

9. What is the expression for the NAND operation in terms of AND and NOT?

a) $A \cdot B$ b) $A+B$

c) (A.B)' d) $A'+B'$

10. Which Boolean operator is represented by the symbol $\oplus$?

a) AND b) OR c) XOR d) NOT

11. What is the key difference between a while loop and a for loop in Python?

a) A for loop is used for iterating over a sequence, while a while loop is used for executing a block of code repeatedly until a condition becomes false.

b) A while loop is used for iterating over a sequence, while a for loop is used for executing a block of code repeatedly until a condition becomes false.

c) They are functionally equivalent, and can be used interchangeably.

d) A for loop is only used for iterating over lists.

12. What does the **pass** statement do in Python loops?

a) Terminates the loop immediately
b) Skips the current iteration and continues with the next one
c) Continues the execution of the loop without any action
d) Breaks out of the loop

13. What is the binary representation of the octal number 67?

a) 110101 b) 111001 c) 100111 d) 101110

14. How is the 2's complement of a binary number obtained?

a) By reversing all the bits. b) By subtracting each bit from 1.
c) By adding 1 to the 1's complement. d) By dividing the binary number by 2.

15. What is the purpose of a truth table in logic?

a) To list all possible combinations of input values and their corresponding outputs for a logical expression.
b) To determine the absolute truth of a statement.
c) To represent only the true combinations in a logical expression.
d) To simplify logical expressions.

16. How can you obtain the last three elements of a list using slicing?

a) `my_list[-3:]` b) `my_list[:-3]`

c) `my_list[-1:-3]` d) `my_list[1:4]`

Assertion and Reason based questions.

17. **Assertion:** In Python, the **append()** method is more efficient than the **insert()** method when adding elements to a list.

Reason: The **append()** method adds elements to the end of the list, while the **insert()** method requires specifying an index, potentially shifting existing elements.

a) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
b) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.
c) Assertion is true, but Reason is false.
d) Both Assertion and Reason are false.

18. **Assertion:** The output of a NAND gate is true only when both of its inputs are false.
Reason: A NAND gate performs logical AND operation followed by a logical NOT operation.

a) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
b) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.
c) Assertion is true, but Reason is false.
d) Both Assertion and Reason are false.

Section-B (Each question carries 2 marks)

1. Define XOR gate with its symbol.
2. Draw logical diagram for the given expression: A'B + (C + D')'
3. Draw a flow chart to input three angles and determine, if they form a triangle or not?
4. Differentiate between interactive and script modes of python.
5. Predict the output of the given code:

```
i=0, sum=0
while i<9:
    If i%4==0:
        sum=sum+i
    i+=2
print(sum)
```

6. Differentiate between append and extend functions of list.
7. Rewrite the following program using for loop:

```
i,sum=1,0
while i<=10:
    sum=sum+i
    i+=2
    print("Sum is-",sum)
```

8. Verify using truth table A + C= A+ A'C + BC
9. Predict output of the given code:

```
rows=5
for i in range(1, rows + 1):
```

```
    for j in range(1, i + 1):
        print(j, end=" ")
    print()
```

10. Write a program to take one string and count number of vowels and digits present in it.
11. How do you merge two dictionaries in Python?

12. Write a program to input one string and convert all the alphabets at odd index to its upper case.

Section-C (3 marks each)

1. Predict the output of the given code

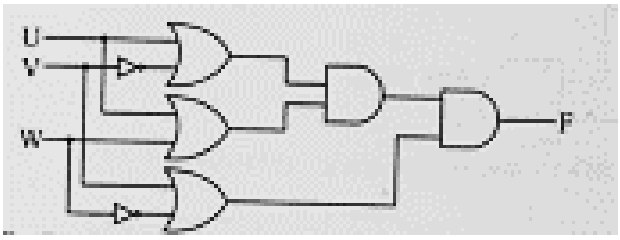
```
tuple1 = (11, 22, 33, 44, 55 ,66)
list1 =list(tuple1)
new_list = []
for i in list1:
    if i%2==0:
        new_list.append(i)
new_tuple = tuple(new_list)
print(new_tuple)
```

2. Write a program to input one sentence and print all those words of the sentence which starts with a vowel and having length more than four.
3. Write a program to create a list of 10 elements. Modify this list so that it does not contain any duplicate element. Print both the lists.

4. Write a program to print this pattern;

```
      1
    2 3
  4 5 6
7 8 9 10
```

5. Write the Boolean expression for the result of the Logic Circuit as shown below



6.Convert as directed:

(a) $(BCA1)_{16}$= ( )$_2$ (b) $(1011.101)_2$=( )$_{10}$

7. Write a program to input your friends' names and their mobile numbers and store them in a dictionary as key value pair and then perform following operations:

(a) Modify mobile number of an existing friend.

(b) Delete data of a friend

(c) Check if a friend is present in dictionary or not

(d) Add a new friend to the dictionary

8. Write short note on any two:
   (a) XNOR gate (b) Demorgans Theorems (c) Universal gate

Section-D (4 marks)

1. Write the most appropriate list method to perform the following task
   a. Add 5^{th} element in the given list
   b. Reverse the items of the list
   c. Delete the given item of the list
   d. To add a list of items at the end of another list

OR

2. Write the most appropriate string method to perform the following task
   a. To delete the white spaces at the left of the string.
   b. To split the string at the first occurrence of the delimiter.
   c. This function returns a copy of the string with its first character capital.
   d. This method breaks a sentence into words.