

2024

**COMPUTER SCIENCE**

**(Theory)**

**Full Marks : 70**

**Pass Marks : 21**

**Time : Three hours**

*All the questions are compulsory.*

*The figures in the right margin indicate full marks for the questions.*

*Select the correct answers from each of the following and rewrite it.*

1. Which one of the following is designed to control the operations of a computer? 1

- A. Application Software
- B. System Software
- C. Utility Software
- D. User

2. The choice of algorithm should be made on the basis of: 1

- A. Time complexity
- B. Space complexity
- C. Both time and space complexity
- D. None of the mentioned

P.T.O.

3. What is the maximum possible length of an identifier?

1

- A. 31 characters
- B. 63 characters
- C. 79 characters
- D. Identifiers can be of any length

4. Which one of these is floor division?

1

- A. /
- B. //
- C. %
- D. None of the mentioned

5. The output of the following code segment is :

1

```
a,b=10,15
x=20
y=25
a=x+y-b
x=a+b-y+10
z=y+b*3+a
x=50
a=x+y+z
print("a:",a)
```

- A. a:100
- B. a:175
- C. a:50
- D. a:180

6. What will be the output of the following statements? 1

```
t= (45, 76,23, 'The' ,89, ('This' ,56),(23, 'That' ),34)
```

```
print(t[4])
```

A. 89

B. The

C. This

D. 56

7. Copying of data or computer software without the owner's permission is called- 1

A. Hacking

B. Plagiarism

C. Software Piracy

D. Netiquette

**Give the very short answer of the following questions :**

8. How do different components of the computer communicate with each other? 1

9. Which method is used to convert the decimal number to binary number system? 1

10. Define an algorithm. 1

11. What is the benefit of Pseudocode? 1

12. Draw the flow chart of for loop. 1

13. What is a Global variable? 1

14. When to use tuple or dictionary in Python? 1

15. Predict the output : 1  
str= "Programming Language"  
str[-8]
16. What is Cyber-crime? 1
17. If you plan to use a short text from an article on the web, what steps must you take in order to credit the sources used ? 1

**Give short answer of the following questions :**

18. The following codes are given in ASCII format. Encode them in general form/  
1000100 1000001 1010100 1000001 2
19. What are the Characteristics of a good Algorithm? 2
20. Draw a flowchart to check whether the number is even or odd. 2
21. Predict the output of the following code fragment : 2  
b=20  
a=90/b  
print("Value of a is :",a)
22. Differentiate between mutable and immutable data types in Python. 2
23. Write a Python program to check whether number is positive, negative or zero using elif statement. 2
24. Create a dictionary 'ODD' of odd numbers between 1 and 10, where the key is the decimal number and the value is the corresponding number in words. Perform the following operation on this dictionary. 2  
ODD={1:'One', 3: 'Three', 5: 'Five', 7: 'Seven', 9: 'Nine'}
- (i) Display the keys
- (ii) Display the values

25. What are the advantages do tuple have over lists? 2
26. Write any two safety measures to reduce the risk of cyber-crime. 2

*Give answer of the following questions :*

27. Write logical expressions corresponding to the following statements in Python :
- (i) The sum of 20 and -10 is less than 12. 3
- (ii) num 3 is not more than 24.
- (iii) The string 'middle' is larger than the string 'first' and smaller than the string 'last'.

**OR**

Construct logical expressions to represent the following conditions :

- (i) N is even but less than 20.
- (ii) Weight is greater than or equal to 50 but less than 70.
- (iii) Donation is in the range of 4000 to 5000 or guest is 1.
28. Write a Python program to calculate the factorial of a given number. 3

**OR**

Write a Python program that print the following pattern :

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

29. Write a Python program using a user defined function that displays sum of first n natural numbers, where n is passed as an argument. 3

**OR**

Write a user defined function addnum( ) to add two numbers and displays their sum.

30. What are the uses of the following Built-in function for lists? 3
- append( )
  - pop( )
  - sorted( )

**OR**

What are the uses of the following Built-in function for tuples?

- len( )
  - count( )
  - index( )
31. Define the following : 3
- Data Analytics
  - Sensors
  - Grid

**OR**

Write the short note on :

- Robotics
- Smart cities
- Blockchains

*Give the answer of the following questions :*

32. What is Software? What is the need of software? Define System software, Programming tools and Application software. 5

*OR*

What is operating System? What are the functions of operating system?

33. Write a Python program to find the factors of a whole number using while loop. 5

*OR*

Write a Python program to check if the input number is prime or not.

34. Write a Python program to find prime numbers between 2 to 50 using nested for loops. 5

*OR*

Write a Python program to give the user the option of converting Fahrenheit to Celsius or Celsius to Fahrenheit depending upon user's choice.

35. Write a Python program using a user defined function with string as a parameter which replaces all vowels in the string with '\*'. 5

*OR*

Write a Python program using a user defined function to check if a string is a palindrome or not.