2025

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. Why is memory management crucial in an operating system? 1

   (A) To allocate and free memory for processes dynamically.

   (B) To manage secondary storage.

   (C) To control network resources.

   (D) To manage device drivers.

2. How many characters can be represented by a 7-bit ASCII code? 1

   (A) 64 (B) 128

   (C) 256 (D) 512

3. Which statement best explains the role of a compiler in programming? 1

(A) It directly executes the source code.

(B) It writes the source code of the programmer.

(C) It improves the readability of code.

(D) It translates source code into machine code.

4. Identify the valid assignment operator in Python from the following. 1

(A) >= (B) +=

(C) != (D) ==

5. How does a while loop differ from a for loop in terms of execution? 1

(A) A while loop executes a block of code a fixed number of times.

(B) A for loop is more efficient and faster than a while loop.

(C) A while loop executes based on a condition; a for loop iterates over a range of sequence.

(D) A while loop is used only for numeric values; a for loop is used for strings.

6. The output of the following code is : 1

math. fabs (math.ceil(–7.4))

(A) 8 (B) 7.0

(C) –7.0 (D) –8

7. What will happen if you attempt to modify a string directly in Python? 1

(A) The modification will be successful.

(B) The string will be converted to lowercase.

(C) An error will be raised.

(D) The string will be duplicated.

8. Which of the following is the correct syntax to create a tuple? 1

(A) Tup = 1,2,3

(B) Tup = {1,2,3}

(C) Tup = [1,2,3]

(D) Tup = (1,2,3)

Questions No. 9 and 10 are Assertion (A) and Reason (R) types. Each question consists of two Statements, namely Assertion (A) and Reason (R). Select the most suitable option considering the Assertion and Reason.

9. Assertion (A) : A dictionary is an unordered collection of data items. 1

Reason (R) : Keys in dictionary are unique and immutable.

(A) Both A and R are true and R is the correct explaination of A.

(B) Both A and R are true but R is not the correct explaination of A.

(C) A is true but R is false.

(D) A is false but R is true.

10. Assertion (A) : Digital footprints can only be created with our knowledge. 1

Reason(R) : Active footprints are created by data we intentionally submit online.

(A) Both A and R are true and R is the correct explaination of A.

(B) Both A and R are true but R is not the correct explaination of A.

(C) A is true but R is false.

(D) A is false but R is true

Answer questions 11 to 17 in a single word or a sentence.

11. What is the common threat associated with digital data? 1

12. Why is decomposition useful in solving complex problems? 1

13. Why are variables important in programming? 1

14. How does **elif** statement enhance the functionality of the **if** statement in Python? 1

15. Explain why you might use the **from** statement instead of **import** statement. 1

16. Explain the significance of negative indexing in lists. 1

17. Why are tuples considered immutable? 1

Give short answer of the following questions.

18. Draw a neat diagram of the structure of a microcontroller and label it. 2

19. What is the binary equivalent of $(0.8125)_{10}$? 2

20. Draw a flowchart to determine whether a given number is a multiple of 17. 2

21. Why does the expression 4+6/2 evaluates to 7 instead of 5? 2

22. What is explicit conversion? Name one explicit conversion function in Python. 1+1=2

23. Create a program that composes a list of your favourite colors and use for loop to display each color. 2

24. Write a user defined function that accepts three numbers and return their average. 2

25. Create a list of 5 even numbers and then remove the last element from the list. 2

26. Define a computer virus and state the primary focus of black hat hackers. 2

27. Explain how email spoofing is used in phishing attempts and why phishing emails are often difficult to detect. 1+1=2

Give answer of the following questions.

28. Explain the primary functions of the three types of buses in a computer system. 3

Or

Explain how user interaction differs between a Command-based Interface and a Graphical User Interface.

29. Describe the differences in user interaction between Virtual Reality (VR) and Augmented Reality (AR). 3

Or

Explain the benefits of using Platform as a Service (PaaS) for software development.

30. Write any three characteristics of a good algorithm. 3

31. Detect and correct the errors in the following code. Underline the corrected code: 3

```
num = int(input('Enter any number:))
if num=0:
    print('Positive number.')
else if num>0:
    print('It is zero')
else:
    print('Negative number.')
```

32. "while loop is an entry controlled loop." Justify using a suitable example. 3

33. PentaTech, a company specializing in tech product reviews, uses lists to manage user-submitted reviews for various gadgets. Each review includes the reviewer's name, the gadget's name and the review text. These reviews are stored in a list as:

reviews = [

['Chaoba', 'Redmi NotePro 13', 'Great phone with excellent battery life!'],

['Rambo', 'HP Envy Laptop', 'Fast performance and light weight.'],

['Bicky', 'Samsung TV', 'Great picture quality and ease of use.']

]

The IT team is responsible for processing and analyzing these reviews to identify trends and gather insights into user preferences and product performance. As a programmer in the IT team, how would you approach the following tasks :

A. How can you add a new review ['Lanchenba', 'Fire-Boltt watch', 'Stylist, useful but small display'] to the list of reviews?

B. How do you access the review text of the first review in the list?

C. How can you clear all reviews from the list? 1+1+1=3

Or

Meera Bookstore uses a Python dictionary named "inventory" to manage its book inventory. In this dictionary, book titles are the keys and the numbers of available copies are the values. For example, the book "My Three Years in Manipur" with 100 copies is store in the inventory as inventory = {"My Three Years in Manipur", 100}. As a programmer in the IT department, how would you approach the following tasks:

A. How can you add a new book "Python Programming" with 300 copies to the inventory?

B. Which method would you used to retrieve the number of copies available for the book "The Magudi Days"?

C. How do you remove the book "My Three Years in Manipur" from the inventory?

Give answer of the following questions.

34. Write a Python program to generate Fibonacci series upto N^{th} term using while loop. 5

Or

Write a Python program to find the reverse of an integer number and sum of its digits.

35. A. Point out two differences between Interactive Mode and Script Mode of Python interpreter.

B. Explain the three logical operators in Python. 2+3=5

Or

A. How does local variables differ from global variables in Python ?

B. Explain the three arguments of the range() function .

36. Write a Python program that accepts a string and counts the number of vowels and consonant in that string. 5

Or

Write a Python program that creates an empty list and populates it with floating point values supplied by the user, then find its largest and smallest element, and also calculate average of it elements. [Use built-in function]

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