📚 MATH LOVE INSTITUTE

Education as a Service (EaaS)

Annual Examination - 2025-26

Computer Science (Solved Sample Paper)

Class: VIII **Subject:** Computer Science **Time:** 2 Hours **Max. Marks:** 50

📋 General Instructions:

- This question paper contains **FIVE** sections - A, B, C, D and E.
- All questions are compulsory.
- **Section A:** Questions 1-10 are Multiple Choice Questions (MCQs) carrying 1 mark each.
- **Section B:** Questions 11-20 are Fill in the Blanks / True-False carrying 1 mark each.
- **Section C:** Questions 21-26 are Short Answer Questions carrying 2 marks each.
- **Section D:** Questions 27-29 are Long Answer Questions carrying 3 marks each.
- **Section E:** Questions 30-32 are Programming Questions carrying 3 marks each.

SECTION A: Multiple Choice Questions (10 × 1 = 10 Marks)

Q1. What is an Algorithm?

(a) A programming language
(b) A step-by-step procedure to solve a problem
(c) A type of computer hardware
(d) A flowchart symbol

✓ **ANSWER**

(b) A step-by-step procedure to solve a problem

Marking: 1 mark for correct option

Q2. Which loop is used when the number of iterations is known in advance?

(a) while loop
(b) for loop
(c) do-while loop
(d) infinite loop

✓ **ANSWER**

(b) for loop

Marking: 1 mark for correct option

Q3. What does the string method upper() do?

(a) Converts string to lowercase
(b) Converts string to uppercase
(c) Removes spaces from string
(d) Reverses the string

✓ **ANSWER**

(b) Converts string to uppercase

📝 Marking: 1 mark for correct option

Q4. Which list method is used to add an element at a specific position?

(a) append()
(b) extend()
(c) insert()
(d) add()

✓ **ANSWER**

(c) insert()

📝 Marking: 1 mark for correct option

Q5. Which AI domain enables machines to understand human language?

(a) Machine Learning
(b) Computer Vision
(c) Natural Language Processing (NLP)
(d) Robotics

✓ **ANSWER**

(c) Natural Language Processing (NLP)

📝 Marking: 1 mark for correct option

Q6. What is the output of: print("Hello World".split())?

(a) ['Hello World']
(b) ['Hello', 'World']

(c) 'Hello World'
(d) Error

✓ **ANSWER**

(b) ['Hello', 'World']

Marking: 1 mark for correct option

Q7. What keyword is used to define a function in Python?

(a) func
(b) define
(c) def
(d) function

✓ **ANSWER**

(c) def

Marking: 1 mark for correct option

Q8. Which method removes the last element from a list?

(a) remove()
(b) delete()
(c) pop()
(d) clear()

✓ **ANSWER**

(c) pop()

📝 Marking: 1 mark for correct option

Q9. Which AI domain helps machines to "see" and interpret images?

(a) Expert Systems
(b) Computer Vision
(c) Natural Language Processing
(d) Data Science

✓ **ANSWER**

(b) Computer Vision

📝 Marking: 1 mark for correct option

Q10. What is the output of range(2, 8, 2)?

(a) [2, 4, 6]
(b) [2, 4, 6, 8]
(c) [0, 2, 4, 6, 8]
(d) [2, 3, 4, 5, 6, 7]

✓ **ANSWER**

(a) [2, 4, 6]

> **Explanation:** range(2, 8, 2) starts from 2, goes up to (but not including) 8, with step size of 2. So it generates: 2, 4, 6.

📝 Marking: 1 mark for correct option

SECTION B: Fill in the Blanks / True-False (10 × 1 = 10 Marks)

Q11. A _____ is a pictorial representation of an algorithm using different symbols.

✓ **ANSWER**

Flowchart

Marking: 1 mark for correct answer

Q12. The _____ loop is used when we don't know the number of iterations in advance.

✓ **ANSWER**

while

Marking: 1 mark for correct answer

Q13. The split() method divides a string into a _____ of substrings.

✓ **ANSWER**

list

Marking: 1 mark for correct answer

Q14. The _____ method removes and returns the last element from a list.

✓ **ANSWER**

pop()

📝 Marking: 1 mark for correct answer

Q15. _____ combines AI with physical machines to perform tasks autonomously.

✓ **ANSWER**

Robotics

📝 Marking: 1 mark for correct answer

Q16. True or False: The continue statement terminates the entire loop.

✓ **ANSWER**

False

> **Explanation:** The continue statement skips the current iteration and moves to the next iteration. The break statement terminates the entire loop.

📝 Marking: 1 mark for correct answer

Q17. True or False: String concatenation is done using the + operator in Python.

✓ **ANSWER**

True

> **Example:** "Hello" + " " + "World" = "Hello World"

📝 Marking: 1 mark for correct answer

Q18. A function that doesn't return a value returns _____.

✓ **ANSWER**

None

📝 Marking: 1 mark for correct answer

Q19. True or False: Lists in Python are mutable (can be changed).

✓ **ANSWER**

True

> **Explanation:** Lists can be modified after creation - elements can be added, removed, or changed.

📝 Marking: 1 mark for correct answer

Q20. _____ systems mimic human expert decision-making abilities.

✓ **ANSWER**

Expert

📝 Marking: 1 mark for correct answer

SECTION C: Short Answer Questions (6 × 2 = 12 Marks)

Q21. Define Algorithm. Give one example from daily life.

✓ **ANSWER**

Algorithm: An algorithm is a step-by-step procedure or set of instructions to solve a problem or perform a task.

Example - Making a Cup of Tea:

1. Boil water in a kettle
2. Put tea leaves/tea bag in a cup
3. Pour hot water into the cup
4. Add sugar and milk as per taste
5. Stir well and serve

📝 Marking: 1 mark for definition + 1 mark for example (Total 2 marks)

Q22. Differentiate between break and continue statements with examples.

✓ **ANSWER**

break Statement	continue Statement
Terminates the entire loop	Skips current iteration and continues with next
Loop execution stops completely	Loop execution continues

Example:
for i in range(1, 6):
  if i == 3:
  break
  print(i)
Output: 1, 2
	Example:
	for i in range(1, 6):
	  if i == 3:
	  continue
	  print(i)
	Output: 1, 2, 4, 5

📝 Marking: 1 mark for each statement explanation (Total 2 marks)

Q23. What will be the output of the following code?
text = "Python Programming"
print(text.replace("Python", "Java"))

✓ **ANSWER**

```
Output: Java Programming
```

Explanation: The replace() method replaces all occurrences of "Python" with "Java" in the string. So "Python Programming" becomes "Java Programming".

📝 Marking: 1 mark for correct output + 1 mark for explanation (Total 2 marks)

Q24. Explain the difference between append() and extend() methods with examples.

✓ ANSWER

append() Method:

- Adds a single element to the end of the list
- Adds the element as a single item (even if it's a list)

```
Example: fruits = ["apple", "banana"]
fruits.append("cherry") print(fruits) Output: ['apple',
'banana', 'cherry'] fruits.append(["mango", "orange"])
print(fruits) Output: ['apple', 'banana', 'cherry',
['mango', 'orange']]
```

extend() Method:

- Adds multiple elements to the end of the list
- Adds each element individually from an iterable

```
Example: fruits = ["apple", "banana"]
fruits.extend(["mango", "orange"]) print(fruits) Output:
['apple', 'banana', 'mango', 'orange']
```

📝 Marking: 1 mark for each method with example (Total 2 marks)

Q25. Name any four domains of Artificial Intelligence.

✓ ANSWER

Four major domains of Artificial Intelligence are:

1. **Machine Learning (ML):** Enables machines to learn from data and improve without explicit programming

2. **Natural Language Processing (NLP):** Helps machines understand and process human language
3. **Computer Vision (CV):** Enables machines to interpret and understand visual information from images and videos
4. **Robotics:** Combines AI with physical machines to perform tasks autonomously

📝 Marking: ½ mark for each correct domain (Total 2 marks)

Q26. What are function arguments? Write the syntax to define a function with arguments.

✓ **ANSWER**

Function Arguments: Function arguments are values that are passed to a function when it is called. These values are used by the function to perform operations.

Syntax:

```
def function_name(argument1, argument2, ...): # function body # statements return result
```

Example:

```
def add_numbers(a, b): sum = a + b return sum result = add_numbers(5, 10) print(result) # Output: 15
```

📝 Marking: 1 mark for explanation + 1 mark for syntax (Total 2 marks)

SECTION D: Long Answer Questions (3 × 3 = 9 Marks)

Q27. Explain the difference between for loop and while loop with examples showing how to print numbers from 1 to 5.

✓ ANSWER

for Loop:

- Used when the number of iterations is known in advance
- Automatically handles initialization, condition checking, and increment/decrement
- More compact and easier to read for definite iterations

```
Example: Print 1 to 5 using for loop for i in range(1, 6): print(i) Output: 1 2 3 4 5
```

while Loop:

- Used when the number of iterations is not known in advance
- Requires manual initialization, condition checking, and increment/decrement
- Continues as long as the condition is True

```
Example: Print 1 to 5 using while loop i = 1 while i <= 5: print(i) i = i + 1 Output: 1 2 3 4 5
```

for Loop	while Loop
Used for definite iterations	Used for indefinite iterations
Initialization happens inside the loop	Initialization happens before the loop
More compact syntax	Requires more lines of code

📝 Marking: 1.5 marks for for loop + 1.5 marks for while loop (Total 3 marks)

Q28. Write a Python program demonstrating the use of three string methods: upper(), lower(), and split() on the string "Welcome To Python Programming".

✓ ANSWER

```
# Program demonstrating string methods text = "Welcome To Python Programming" # Method 1: upper() - Converts all characters to uppercase uppercase_text = text.upper() print("Original String:", text) print("Uppercase:", uppercase_text) # Method 2: lower() - Converts all characters to lowercase lowercase_text = text.lower() print("Lowercase:", lowercase_text) # Method 3: split() - Splits string into a list of words words_list = text.split() print("Split into words:", words_list) print("Number of words:", len(words_list)) # Additional: split with custom separator text2 = "Python-Java-C++-JavaScript" languages = text2.split("-") print("\nSplit by hyphen:", languages)
```

```
OUTPUT: Original String: Welcome To Python Programming Uppercase: WELCOME TO PYTHON PROGRAMMING Lowercase: welcome to python programming Split into words: ['Welcome', 'To', 'Python', 'Programming'] Number of words: 4 Split by hyphen: ['Python', 'Java', 'C++', 'JavaScript']
```

Explanation of Methods:

- **upper():** Returns a new string with all characters converted to uppercase
- **lower():** Returns a new string with all characters converted to lowercase
- **split():** Splits the string into a list of substrings based on whitespace (default) or specified separator

📝 Marking: 1 mark for each method demonstration + correct output (Total 3 marks)

Q29. Explain Machine Learning with its three types. Give one example for each type.

✓ **ANSWER**

Machine Learning (ML): Machine Learning is a domain of Artificial Intelligence that enables machines to learn from data and improve their performance without being explicitly programmed. ML systems identify patterns in data and make decisions or predictions based on those patterns.

Three Types of Machine Learning:

1. Supervised Learning:

- The algorithm learns from labeled data (input-output pairs)
- The system is trained with examples where the correct answer is known
- After training, it can predict outputs for new, unseen inputs
- **Example:** Email Spam Detection - The system is trained with emails labeled as "spam" or "not spam". After learning patterns, it can classify new emails automatically.

2. Unsupervised Learning:

- The algorithm learns from unlabeled data
- The system finds hidden patterns and structures in the data on its own
- No correct answers are provided during training
- **Example:** Customer Segmentation - A shopping website groups customers based on their browsing and buying patterns without any pre-defined categories. It discovers natural groupings like "frequent buyers", "window shoppers", etc.

3. Reinforcement Learning:

- The algorithm learns by interacting with an environment
- It receives rewards for good actions and penalties for bad actions
- The goal is to maximize cumulative reward over time

- **Example:** Game-Playing AI - An AI learning to play chess gets positive rewards for winning moves and negative rewards for losing moves. Over time, it learns winning strategies through trial and error.

Type	Data Used	Learning Method	Example
Supervised	Labeled Data	Learn from examples	Spam Detection
Unsupervised	Unlabeled Data	Find patterns	Customer Grouping
Reinforcement	Environment feedback	Trial and error	Game AI

📝 Marking: 1 mark for ML definition + 0.67 mark for each type with example (Total 3 marks)

SECTION E: Programming Questions (3 × 3 = 9 Marks)

Q30. Write a Python program using while loop to print all odd numbers from 1 to 20.

✓ **ANSWER**

Method 1: Using increment of 2

```
# Print odd numbers from 1 to 20 using while loop num = 1
print("Odd numbers from 1 to 20:") while num <= 20:
print(num, end=" ") num = num + 2 # Increment by 2 to get
next odd number
```

Method 2: Using if condition

```
# Print odd numbers from 1 to 20 using while loop with condition num = 1 print("Odd numbers from 1 to 20:") while num <= 20: if num % 2 != 0: # Check if number is odd print(num, end=" ") num = num + 1
```

OUTPUT (Both methods): Odd numbers from 1 to 20: 1 3 5 7 9 11 13 15 17 19

Explanation:

- **Method 1:** Starts with 1 (first odd number) and increments by 2 each time to get only odd numbers
- **Method 2:** Checks each number from 1 to 20, prints only if it's odd (num % 2 != 0)
- Both methods produce the same output
- Method 1 is more efficient as it doesn't check even numbers

📝 Marking: 1 mark for correct loop structure + 1 mark for logic + 1 mark for output (Total 3 marks)

Q31. Write a Python program to create a list of fruits, add "Mango" to it, remove "Apple", sort the list, and print the final list.

✓ **ANSWER**

```
# Program to perform various list operations # Step 1: Create a list of fruits fruits = ["Apple", "Banana", "Cherry", "Orange"] print("Original List:", fruits) # Step 2: Add "Mango" to the list using append() fruits.append("Mango") print("After adding Mango:", fruits) # Step 3: Remove "Apple" from the list fruits.remove("Apple") print("After removing Apple:", fruits) # Step 4: Sort the list in alphabetical order fruits.sort() print("After sorting:", fruits) # Step 5: Print the final list print("\nFinal List of Fruits:",
```

```
fruits) # Additional: Display with index print("\nFruits with index:") for i in range(len(fruits)): print(f"{i+1}. {fruits[i]}")
```

OUTPUT: Original List: ['Apple', 'Banana', 'Cherry', 'Orange'] After adding Mango: ['Apple', 'Banana', 'Cherry', 'Orange', 'Mango'] After removing Apple: ['Banana', 'Cherry', 'Orange', 'Mango'] After sorting: ['Banana', 'Cherry', 'Mango', 'Orange'] Final List of Fruits: ['Banana', 'Cherry', 'Mango', 'Orange'] Fruits with index: 1. Banana 2. Cherry 3. Mango 4. Orange

List Methods Used:

- **append(item):** Adds an item to the end of the list
- **remove(item):** Removes the first occurrence of the specified item
- **sort():** Sorts the list in ascending order (alphabetically for strings)

📝 Marking: 0.75 mark for each operation (append, remove, sort) + 0.75 for output (Total 3 marks)

Q32. Create a function check_even_odd() that takes a number as parameter and prints whether it is even or odd. Call this function with number 15.

✓ **ANSWER**

```
# Define function to check even or odd def check_even_odd(number): """ This function checks if a number is even or odd Parameter: number - the number to be checked """ if number % 2 == 0: print(f"{number} is an EVEN number") else: print(f"{number} is an ODD number") # Call the function with different numbers print("Checking number 15:") check_even_odd(15) print("\nChecking number 20:") check_even_odd(20) print("\nChecking number 7:")
```

```
check_even_odd(7) print("\nChecking number 100:")
check_even_odd(100)
```

OUTPUT: Checking number 15: 15 is an ODD number Checking number 20: 20 is an EVEN number Checking number 7: 7 is an ODD number Checking number 100: 100 is an EVEN number

Explanation:

- **def check_even_odd(number):** Defines a function named check_even_odd with one parameter 'number'
- **number % 2 == 0:** Checks if the number is divisible by 2 (remainder is 0)
- If remainder is 0, the number is EVEN
- If remainder is 1, the number is ODD
- The function is called with 15 as argument, which prints "15 is an ODD number"

Alternative Solution with return statement:

```
# Alternative: Function that returns the result def
check_even_odd_return(number): if number % 2 == 0: return f"
{number} is EVEN" else: return f"{number} is ODD" # Call and
print the result result = check_even_odd_return(15)
print(result) # Output: 15 is ODD
```

📝 Marking: 1 mark for function definition + 1 mark for logic + 1 mark for function call and output (Total 3 marks)

📚 Important Topics Summary

Chapter 6: Algorithmic Intelligence

- Algorithm: Step-by-step procedure to solve a problem

- Flowchart: Pictorial representation using symbols (Terminal, Input/Output, Process, Decision, Flow lines)
- Pseudocode: Plain language description of algorithm steps

Chapter 7: Loops in Python

- **for loop:** Used when iterations are known (range function)
- **while loop:** Used when iterations depend on condition
- **break:** Exits the loop completely
- **continue:** Skips current iteration, continues with next

Chapter 8: Functions and Strings

- **Function:** def function_name(parameters): return value
- **String Methods:** upper(), lower(), split(), replace(), join(), strip(), find(), count()

Chapter 9: Lists in Python

- **Creation:** list_name = [item1, item2, ...]
- **Methods:** append(), extend(), insert(), remove(), pop(), sort(), reverse(), clear()
- Lists are mutable (can be changed after creation)

Chapter 10: Domains of AI

- **Machine Learning:** Systems learn from data (Supervised, Unsupervised, Reinforcement)
- **NLP:** Understanding human language (Alexa, Google Assistant, translation)
- **Computer Vision:** Interpreting images/videos (Face recognition, self-driving cars)
- **Robotics:** AI with physical machines (Industrial robots, drones)
- **Expert Systems:** Mimic human expert decisions (Medical diagnosis, financial planning)

Chapter 11: Future of AI

- **Positive Impacts:** Healthcare improvements, personalized education, increased productivity, smart cities
- **Ethical Concerns:** Privacy issues, job displacement, bias in AI, accountability, security

- **Future Applications:** Autonomous vehicles, advanced healthcare, climate change solutions, space exploration
- **Need for:** Ethical AI development, proper regulations, skill development, responsible innovation

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This is a solved sample paper for practice purposes

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