

SCO INTERNATIONAL CODING OLYMPIAD 2023-24

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

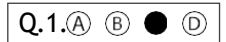
Guidelines for the Candidate

1. Before the exam begins, you will have an additional 20 minutes to complete the OMR Sheet with personal information.
2. On the OMR Sheet, clearly write your name, **school code, class, roll number, and mobile number..**
3. Four sections make up the question paper:
4. Every inquiry must be answered. There are no failing grades. Calculator use is not allowed.
5. There is just ONE right response. Select ONE response choice only.
6. Use only an HB pencil or a blue or black ballpoint pen to indicate your choice of responses by darkening the corresponding circles on the OMR Sheet. E.g.

Q.1: What is the capital of India?

- A. Kolkata B. Mumbai C. Delhi D. Chennai

You must shade the circle next to option C on the OMR Sheet since that is the right response.



7. At the conclusion of the test, hand over the OMR Sheet to the Invigilator.
8. Before attempting the paper, kindly provide your personal information in the box provided on this page. .



Name:.....

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Section 1: Intro to Programming

1. What is a variable in programming?
A) A constant value
B) A location in memory that stores data
C) A type of data
D) A function
Answer: B
Explanation: A variable is a storage location in memory that holds data and can be changed during program execution.

2. Which data type is used to store a decimal number?
A) int
B) str
C) float
D) bool
Answer: C
Explanation: The float data type is used to represent decimal numbers.

3. Which of the following is not a valid variable name in Python?
A) my_var
B) 2nd_var
C) var_name
D) _var
Answer: B
Explanation: Variable names cannot start with a number in Python.

4. What is the correct way to declare a variable with the integer value 10 in Python?
A) int x = 10
B) x = int(10)
C) x = 10
D) x: int = 10
Answer: C
Explanation: In Python, x = 10 is enough to declare an integer without specifying the type.

5. What will the following code output?
python
Copy code
x = 5
x = x + 10
print(x)
A) 5
B) 10
C) 15

	<p>D) 0 Answer: C Explanation: $x = x + 10$ adds 10 to x, resulting in 15.</p>
6.	<p>Which of the following is the correct representation of a string? A) "Hello" B) 10 C) True D) 3.14 Answer: A Explanation: "Hello" is a string (text), while other options are different data types.</p>
7.	<p>Which data type is typically used for True/False values? A) int B) str C) float D) bool Answer: D Explanation: The bool data type is used for Boolean values True and False.</p>
8.	<p>How do you declare a constant variable in Python? A) Using const B) By using capital letters (e.g., PI = 3.14) C) Using final D) None of the above Answer: B Explanation: Python conventionally represents constants with uppercase variable names.</p>
9.	<p>Which of the following data types can store fractional numbers? A) int B) bool C) float D) str Answer: C Explanation: The float data type is used for fractional or decimal numbers.</p>
10.	<p>What is the result of $7 // 2$ in Python? A) 3.5 B) 3 C) 4 D) Error Answer: B Explanation: <code>//</code> is the floor division operator, giving the integer part of the division (3).</p>

Section 2: Basic Coding Applications

11. Which statement checks if a number x is greater than 10?

- A) if x > 10:
- B) if x == 10:
- C) if x < 10:
- D) if x <= 10:

Answer: A

Explanation: if x > 10 checks if x is greater than 10.

12. How many times will this loop execute?

```
python
Copy code
for i in range(3):
    print(i)
```

- A) 2
- B) 3
- C) 4
- D) Infinite

Answer: B

Explanation: range(3) generates numbers 0, 1, and 2, resulting in 3 executions.

13. Which operator is used to check if two values are equal?

- A) =
- B) ==
- C) !=
- D) ===

Answer: B

Explanation: == is used to check equality.

14. In a loop, which keyword can be used to exit the loop prematurely?

- A) exit
- B) continue
- C) break
- D) stop

Answer: C

Explanation: break exits the loop prematurely.

15. What will this code output?

```
python
Copy code
count = 0
for i in range(5):
    count += i
```

	<p>print(count)</p> <p>A) 10 B) 15 C) 5 D) 0</p> <p>Answer: A</p> <p>Explanation: $0 + 1 + 2 + 3 + 4 = 10$.</p>
16.	<p>How does a while loop function differently from a for loop?</p> <p>A) Executes indefinitely B) Executes a fixed number of times C) Repeats based on a condition D) Can't exit</p> <p>Answer: C</p> <p>Explanation: A while loop runs until a specified condition is false.</p>
17.	<p>What will the following code output?</p> <pre>python Copy code x = 5 if x > 3: print("Greater") else: print("Smaller")</pre> <p>A) Greater B) Smaller C) Error D) None</p> <p>Answer: A</p> <p>Explanation: Since x is 5, which is greater than 3, "Greater" is printed.</p>
18.	<p>Which of the following best describes an if statement?</p> <p>A) A loop B) A condition C) A function D) An assignment</p> <p>Answer: B</p> <p>Explanation: An if statement evaluates a condition to determine code execution.</p>
19.	<p>If you start with 15 and subtract 3 three times, what is the result?</p> <p>A) 9 B) 12 C) 6 D) 5</p> <p>Answer: A</p>

	Explanation: $15 - (3 * 3) = 15 - 9 = 6$.
20.	<p>If "1, 3, 5, 7, ___" continues, what is next?</p> <p>A) 9 B) 10 C) 8 D) 6</p> <p>Answer: A Explanation: The pattern increases by 2 each time, so the next number is 9.</p>
Section 3: Game Development Basics	
21.	<p>Which of the following is used to represent a character or object in a game?</p> <p>A) Sprite B) Pixel C) Tile D) Frame</p> <p>Answer: A Explanation: A sprite is an image or character representation used in 2D games.</p>
22.	<p>Which code snippet would simulate the roll of a die (random number between 1 and 6) in Python?</p> <p>A) <code>import random; random.randint(0, 6)</code> B) <code>import random; random.randint(1, 6)</code> C) <code>import random; random.random(1, 6)</code> D) <code>import random; random.die(1, 6)</code></p> <p>Answer: B Explanation: <code>random.randint(1, 6)</code> generates a random integer between 1 and 6, inclusive.</p>
23.	<p>What is a "loop" used for in game development?</p> <p>A) To keep game objects on the screen B) To repeatedly update the game state C) To stop the game D) To add new game levels</p> <p>Answer: B Explanation: Loops in game development help update the game state by repeatedly executing code.</p>
24.	<p>How would you detect a collision between two objects in a game?</p> <p>A) Using the if statement B) Checking overlapping coordinates C) Using <code>print()</code> statements D) Using a for loop</p> <p>Answer: B Explanation: Collision detection typically involves checking if the coordinates of two</p>

	objects overlap.
25.	<p>What would this code snippet create in a game?</p> <pre>python Copy code score = 0 while score < 10: score += 1</pre> <p>A) Countdown timer B) Game over screen C) Score increment until 10 D) Error</p> <p>Answer: C Explanation: The while loop increases the score by 1 until it reaches 10.</p>
26.	<p>Which Python library is commonly used for 2D game development?</p> <p>A) NumPy B) Pandas C) Pygame D) Matplotlib</p> <p>Answer: C Explanation: Pygame is a popular library for 2D game development in Python</p>
27.	<p>How do you move a character to the right in a 2D grid?</p> <p>A) Increment the y coordinate B) Increment the x coordinate C) Decrement the y coordinate D) Decrement the x coordinate</p> <p>Answer: B Explanation: Increasing the x coordinate moves the character rightward.</p>
28.	<p>Which term refers to the images that make up an animation?</p> <p>A) Sprites B) Frames C) Pixels D) Backgrounds</p> <p>Answer: B Explanation: Frames are individual images displayed in sequence to create an animation.</p>
29.	<p>What is the purpose of a game loop?</p> <p>A) To render the game's background only once</p>

	<p>B) To continuously update and render the game screen C) To stop the game D) To load assets Answer: B Explanation: A game loop allows the game to update and render continuously, making it interactive.</p>
30.	<p>What does the following code do in game development? python Copy code score += 1</p> <p>A) Decreases the score by 1 B) Sets the score to 1 C) Increases the score by 1 D) Multiplies the score by 1 Answer: C Explanation: += 1 adds 1 to the current score.</p>
	<p>Section 4: Achievers Section</p>
31.	<p>What will this code do in a guessing game? python Copy code guess = 0 while guess != 5: guess = int(input("Guess a number: "))</p> <p>A) It will end immediately B) It will run until 5 is guessed C) It will loop 5 times D) It will give an error Answer: B Explanation: The loop continues until guess equals 5.</p>
32.	<p>How would you store multiple scores in a game efficiently? A) Using a single variable B) Using a list or array C) Using a for loop D) Using a while loop Answer: B Explanation: Lists or arrays can store multiple values like scores efficiently.</p>

33.	<p>Which function could track a player's level completion time?</p> <p>A) input() B) time() C) len() D) random()</p> <p>Answer: B Explanation: The time() function can be used to measure elapsed time.</p>
34.	<p>What would this code print if x = 2?</p> <pre>python Copy code if x > 5: print("High") elif x == 2: print("Exact") else: print("Low")</pre> <p>A) High B) Exact C) Low D) Error</p> <p>Answer: B Explanation: Since x equals 2, "Exact" is printed.</p>
35.	<p>What does recursion mean in programming?</p> <p>A) Looping until a condition is met B) A function calling itself C) A function calling another function D) Repeating code manually</p> <p>Answer: B Explanation: Recursion is when a function calls itself.</p>
36	<p>In a game, how would you make a player jump?</p> <p>A) Increase their y coordinate briefly, then decrease it B) Decrease their y coordinate C) Increase their x coordinate D) Change the background</p> <p>Answer: A</p>

	<p>Explanation: Jumping typically involves briefly increasing and then decreasing the y coordinate.</p>
37	<p>Which of these best represents an inventory system in a game?</p> <p>A) A list or array B) A single integer C) A function D) A string</p> <p>Answer: A</p> <p>Explanation: A list or array can store multiple items, making it suitable for an inventory.</p>
38	<p>What will len(["apple", "banana", "cherry"]) return?</p> <p>A) 1 B) 2 C) 3 D) Error</p> <p>Answer: C</p> <p>Explanation: len() counts items in the list, resulting in 3.</p>
39	<p>How would you write a function to return the largest of three numbers?</p> <p>A) max(x, y, z) B) min(x, y, z) C) max([x, y]) D) max(x)</p> <p>Answer: A</p> <p>Explanation: max(x, y, z) finds the largest of three values.</p>
40	<p>What will this code do?</p> <pre>python Copy code total = 0 for i in range(1, 5): total += i print(total)</pre> <p>A) Print 10</p>

	<p>B) Print 15 C) Print 5 D) Print 0 Answer: A Explanation: The code adds $1 + 2 + 3 + 4$, totaling 10.</p>
41	<p>How would you generate a random position on a 10x10 grid?</p> <p>A) Using two random integers between 1 and 10 B) Using a loop C) Using if statements D) Using for loop Answer: A Explanation: Random integers for x and y between 1 and 10 generate a position.</p>
42	<p>In a scoring system, how could you reward faster players?</p> <p>A) Using a higher score multiplier for faster completions B) Giving random scores C) Reducing points over time D) Ignoring time Answer: A Explanation: A score multiplier based on completion time can reward faster players.</p>
43	<p>What is the purpose of a main game loop?</p> <p>A) To create infinite loops B) To update game states and render continuously C) To handle keyboard input only D) To draw graphics once Answer: B Explanation: A main game loop updates states and renders the game continuously.</p>
44	<p>How would you pause a game using code?</p> <p>A) Using a for loop B) Using break C) Using <code>time.sleep()</code> D) Using <code>print()</code> Answer: C Explanation: <code>time.sleep()</code> pauses execution for a specified duration.</p>

45 Which of these would best add complexity to a simple game?

- A) Adding levels and new challenges
- B) Using print() statements only
- C) Increasing font size
- D) Removing all challenges

Answer: A

Explanation: Adding levels and new challenges can increase game complexity.

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