CODING & ROBOTICS PRIMARY SCHOOL OLYMPIADS:

GRADES 4 - 7

E-mail: Info@saolympiads.co.za website: www.saolympiads.co.za

GRADE 9

DATE: 8 AUGUST 2025

TIME: 60 MINUTES

INSTRUCTIONS:

1. This booklet has multiple-choice questions, true or false, computational questions, practical and problem-solving questions
2. The total of this booklet is out of fifty marks.
3. You have 60 minutes for the paper.
4. Read the questions carefully before answering.
5. Visit the website: www.saolympiads.co.za.

NAME OF LEARNER:	
SCHOOL:	GRADE:

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SECTION A: MULTIPLE CHOICE QUESTIONS

1. What is the primary goal of computational thinking (1)

   A. To understand computer hardware
   B. To develop problem-solving skills using computer-based techniques
   C. To memorise programming languages
   D. To repair computers

2. Which statement best describes an algorithm? (1)

   A. A detailed description of a robot's design
   B. A set of rules for how a network should operate
   C. A step-by-step procedure for solving a problem
   D. A programming language for creating games

3. What is the function of a loop in prpgramming? (1)

   A. To end the execution of the program
   B. To repeat a sequence of instructions
   C. To verify the user's input
   D. To display output to the user

4. Which of the following is an example of an actuator in robotics? (1)

   A. Sensor
   B. Battery
   C. Servo motor
   D. Microcontroller

5. What role do sensors play in robotics? (1)

   A. They provide energy to the robot
   B. They process programming instructions
   C. They detect and respond to physical stimuli
   D. They act as the robot's brain

6. What is the purpose of debugging in the coding process?? (1)

   A. To enhance the speed of the program
   B. To add new features to the software
   C. To find and fix errors
   D. To convert the code into machine language

7. Which of these is a practice associated with Design Thinking? (1)

   A. Incremental development
   B. Prototyping
   C. Data typing
   D. Broadcasting

8. In coding, what is an 'if' statement used for?? (1)

   A. To repeat a block of code multiple times
   B. To make a decision in the program
   C. To stop the execution of the program
   D. To declare a variable

9. What is meant by digital citizenship? (1)

A. Building online communities
B. Ethical and responsible behavior online
C. Voting in digital elections
D. Citizenship verified by digital means

10. What is a key component of robotics? (1)

A. Algorithms
B. E-commerce
C. Actuators
D. Hyperlinks

11. What is the primary use of variables in programming? (1)

A. To store data values
B. To perform operations
C. To control the user interface
D. To secure the program

12. Why is collaboration important on robotics projects? (1)

A. It allows for multiple robots to perform tasks simultaneously
B. It facilitates the sharing of ideas and solutions
C. It helps in managing large data sets
D. It reduces the cost of projects

13. What does modularisation in software development refer to? (1)

A. The process of testing the software
B. Breaking a program into smaller, manageable parts
C. The purchase of software modules
D. The method of increasing software size

14. Which of these is an example of parallelism in computing? (1)

A. A single process running on multiple CPUs
B. One task being divided among multiple users
C. Sequential execution of program instructions
D. Use of multiple algorithms to solve a problem

15. What does event-driven programming refer to? (1)

A. Programs that run only during specific events
B. Programming that relies on users' actions to determine the flow of execution
C. Coding practices that are based on annual tech events
D. Programming that triggers events at random

16. What is the importance of data types in programming?

A. They determine the type of operations that can be performed on data
B. They make the program run faster
C. They are only necessary in advanced programming
D. They simplify the debugging process

17. Which is an example of using an operator in programming? (1)

A. Calling a function
B. Declaring a variable
C. Evaluating conditions
D. Accessing database records

18. What is a boolean in programming? (1)

A. A type of loop
B. A data type representing true/false conditions
C. A programming methodology
D. A type of error

19. What is incremental development in software engineering? (1)

A. A method where software is developed and delivered in pieces
B. A software development policy
C. A type of software testing
D. A version control strategy

20. What does abstraction help with in programming? (1)

A. Reducing code complexity and focusing on the operations
B. Increasing processing speed
C. Making the software aesthetically pleasing
D. Enhancing user interaction

(20)

SECTION B: TRUE OR FALSE STATEMENTS

1. In programming, an infinite loop is a loop that runs without ever stopping unless explicitly instructed to do so. (1)

   A. True
   B. False

2. Actuators are used in robotics primarily for processing data and making decisions. (1)

   A. True

   B. False

3. Debugging is a process that occurs only after the entire software has been developed and is ready for deployment. (1)

   A. True

   B. False

4. Modularisation in software development allows different parts of a program to be developed independently and can improve maintainability.. (1)

   A. True

   B. False

5. Event-driven programming means that the sequence of program execution is determined by events such as user actions, sensor outputs, or messages from other programs. (1)

   A. True

   B. False

(5)

SECTION C: COMPUTATIONAL

‘when green flag clicked’ block	‘say "Correct!" for 2 seconds’ block
‘say "Incorrect, the correct answer is Paris." for 2 seconds’ block	‘ask "What is the capital of France?" and wait’ block
‘wait (0.5) seconds’ block	‘if <random <80> then’ block
‘if <(answer) = [Paris]>’ block	‘else’ block

1. Using the lines above, create a quiz game in Scratch where the player is asked: "What is the capital of France?" Provide immediate feedback based on their answer. (5)

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'when green flag clicked' block	'else' block
'say "So close! You were just 1 away."' Block	'if <(answer) = (Secret Number - 1)> then' block
'say "You guessed right!" for 2 seconds' block	'set [Secret Number] to (pick random 1 to 10)' block
'if <(answer) = (Secret Number)>' block	'ask "Guess a number between 1 and 10" and wait' block
'say "Wrong, the correct number was (Secret Number)" for 2 seconds' block	'wait (0.3) seconds' block

2. Develop a number guessing game in Scratch. The player guesses a number between 1 and 10. If they guess correctly, the game congratulates them; otherwise, it tells them the right answer. (5)

(10)

SECTION D: PRACTICAL APPLICATION AND PROBLEM SOLVING

1. Create a Scratch project where the robot monitors two variables: temperature and humidity. If the temperature exceeds 30 degrees Celsius or the humidity exceeds 70%, the robot should alert the user. (7)

‘else’ block	‘if <(Temperature) > 30 or (Humidity) > 70>’ block
‘set [Humidity] to (pick random 50 to 90)’ block	‘say "Alert: Check environmental conditions!"’ block
‘when green flag clicked’ block	‘set [Temperature] to (pick random 20 to 40)’ block
‘if <(Temperature) > 35> then’ block	‘set [Humidity] to (pick random 0 to 100)’ block
‘say “Conditions are normal”’ block	‘wait (1) seconds’ block

2. Design a Scratch project that facilitates the tracking of books by allowing users to input a book ID and select the status of the book (checked out or returned). The program should confirm the action for the user in a concise manner. (8)

'ask "Enter book ID and status (C/R):" and wait' block	'say "Book ID (answer before [space]) checked out"' block
'else' block	'if <(answer) contains [R]>' block
'say "Invalid status entered. Please enter C for checkout or R for return after the Book ID" block	'when green flag clicked' block
'wait (0.5) seconds' block	'say "Invalid input. Please try again!" for 2 seconds' block
'say "Book ID (answer before [space]) returned"' block	'if <(answer) contains [C]>' block

TOTAL MARKS = 50