E-mail: Info@saolympiads.co.za

website: www.saolympiads.co.za

GRADE 8

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:**

SECTION A: MULTIPLE CHOICE QUESTIONS

1. What is the main purpose of an algorithm in programming? (1)

   A. To document the programmer's ideas
   B. To provide a set of instructions for solving a problem
   C. To enhance the speed of the computer
   D. To create graphical user interfaces

2. Which of these is a fundamental concept in coding? (1)

   A. Algorithm
   B. Hypothesis
   C. Circuit design
   D. Data analysis

3. What does debugging involve? (1)

   A. Enhancing the features of a program
   B. Making the program run faster
   C. Identifying and fixing errors in the program
   D. Converting code from one language to another

4. What is the main function of a loop in programming? (1)

   A. To stop the execution of a program
   B. To repeat a sequence of instructions
   C. To declare variables
   D. To check the validity of data

5. In the context of digital citizenship, what is netiquette? (1)

   A. Installing network equipment
   B. Respectful and ethical behavior online
   C. Networking techniques
   D. Internet speed optimisation

6. Which of these is considered a conditional statement in coding? (1)

   A. For
   B. While
   C. If-else
   D. Repeat

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

   A. They provide power to the robot
   B. They program the robot's actions
   C. They help the robot interact with its environment
   D. They design the robot's structure

8. Which concept is essential for understanding how computers and robots process information? (1)

   A. Chemical reactions
   B. Boolean Logic
   C. Literary analysis
   D. Photosynthesis

9. What is meant by design thinking in the context of robotics? (1)

A. Styling the robot's appearance
B. Engineering the robot's electrical circuits
C. Developing creative solutions to problems
D. Marketing the robot to consumers

10. What is incremental development in coding? (1)

A. A method of adding features to a program one at a time
B. A way of deleting unnecessary parts of a program
C. A method of testing a program in stages
D. A style of team management

11. How does abstraction benefit programmers? (1)

A. By allowing them to manage lower-level details
B. By removing complexity and focusing on the big picture
C. By improving the graphical quality of a program
D. By translating programs into different languages

12. What is the significance of parallelism in robotics? (1)

A. It describes the ethical implications of using robots
B. It allows different processes to run simultaneously
C. It refers to the alignment of robot components
D. It is the study of robot history

13. Which tool would you use to write a program for a robot? (1)

A. A screwdriver
B. An Integrated Development Environment (IDE)
C. A web browser
D. A paintbrush

14. What does a power source do in a robot? (1)

A. It controls the robot's movements.
B. It provides energy for the robot to function.
C. It makes decisions for the robot.
D. It programs the robot's tasks.

15. Why is collaboration important in robotics? (1)

A. It ensures robots are capable of social interaction
B. It involves multiple disciplines to build effective solutions
C. It reduces the cost of robot production
D. It refers to the interaction between robots and pets

16. What type of operator is used to compare two values in programming? (1)

A. Arithmetic operator
B. Logical operator
C. Comparison operator
D. Assignment operator

17. What does iteration in coding refer to? (1)

A. Stopping the execution of loops
B. Skipping steps in an algorithm
C. Repeating steps a specific number of times
D. Returning to the first line of code

18. In coding, what is an event? (1)

A. An error or bug in the program
B. A user action that triggers a response
C. A social gathering for programmers
D. The release of a new software version

19. What is modularization in software development? (1)

A. The process of testing software
B. Breaking a program into smaller, manageable parts
C. Selling software in modules
D. Increasing the size of the software

20. What is source code in programming? (1)

A. The final version of a program
B. The original design document for a program
C. The human-readable instructions that make up a program
D. The password required to access a program

(20)

SECTION B: TRUE OR FALSE STATEMENTS

1. An algorithm must be written in a specific programming language to be considered valid. (1)

   A. True
   B. False

2. Debugging is only necessary when a program does not compile. (1)

   A. True
   B. False

3. In programming, loops are used to execute a block of code multiple times based on a specified condition. (1)

   A. True
   B. False

4. Sensors in robotics are used only for detecting obstacles. (1)

   A. True
   B. False

5. Modularisation in software development makes it harder to maintain and update a program. (1)

   A. True
   B. False

(5)

SECTION C: COMPUTATIONAL

'when green flag clicked' block	'ask "enter second number" and wait' block
'set variable [FirstNumber] to (answer)' block	'set variable [result] to ((FirstNumber) + (answer))' block
'set [result] to (result * 2)' block	'wait (0.1) seconds' block
'say (result)' block	'ask "enter first number" and wait' block

1. Using the lines above, create a simple calculator in Scratch that can add two numbers input by the user and display the result. (5)

'when green flag clicked' block	'repeat (10)' block
'if <Countdown = 5> then' block	'change [Countdown] by -2' block
'change [Countdown] by -1' block	'play sound (alarm)' block
'say (Countdown) for 1 second' block	'set variable [Countdown] to 10' block

2. In a Scratch project, create a countdown timer that starts from 10 and counts down to zero, displaying each number and playing a sound when it reaches zero. (5)

(10)

SECTION D: PRACTICAL APPLICATION AND PROBLEM SOLVING

1. Your school is participating in a community clean-up and recycling drive. You have been tasked with designing a simple automated system using Scratch to sort items into two categories: 'Recyclables' and 'Non-Recyclables'. The sorter should ask for the type of material (e.g., plastic, paper, metal, or trash), and then place it in the correct category. (7)

‘else’ block	‘ask "what material are you sorting?" and wait’ block
‘repeat the process for a new item’ block	‘say “recyclable”’ block
‘ If <(answer) = [plastic] or (answer) = [paper] or (answer) = [metal]>’ block	‘when green flag clicked’ block
‘set [sorting process] to [done]’ block	‘say “This material is not accepted for recycling”’ block
‘‘say “non-recyclable”’ block	‘wait (0.5) seconds’ block

2. You are creating an interactive story in Scratch where the viewer chooses whether the character takes the 'mountain path' or 'forest path' on a quest to find a lost treasure. The path chosen affects the story's outcome. (8)

‘say "You chose the forest path! Watch out for the mysterious creatures!" block	‘if <(answer) = [mountain]>’ block
‘change [mountain height] effect by (50)’ block	‘change [forest darkness] effect by (20)’ block
‘say "You chose the mountain path! Brave choice!"’ block	‘else’ block
‘ask "Which path should the character take: mountain or forest?" and wait’ block	‘when green flag clicked’ block
‘go to backdrop [forest]’ block	‘go to backdrop [mountain]’ block

TOTAL MARKS = 50