CODING & ROBOTICS PRIMARY SCHOOL OLYMPIADS:

GRADES 4 - 7

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GRADE 6

DATE: 26 AUGUST 2025

TIME: 60 MINUTES

INSTRUCTIONS:

1. This booklet has multiple-choice questions, true or false questions and short answer 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 function of an actuator in robotics? (1)

    A. To control software programs
    B. To convert electrical energy into mechanical motion
    C. To store data
    D. To sense environmental changes

2. Which of these is a core component of digital literacy? (1)

    A. Understanding Boolean logic
    B. Building mechanical devices
    C. Conducting scientific experiments
    D. Painting digital art

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

    A. To store data that can change during program execution
    B. To permanently store files
    C. To enhance the speed of the processor
    D. To display output on the monitor

4. Which Scratch block is used to continuously check for conditions? (1)
    A. Repeat
    B. Wait until
    C. Forever
    D. If then else

5. In networking, what does the term IP address refer to? (1)

   A. A unique set of rules for data encryption
   B. A numerical label assigned to each device connected to a computer network
   C. A storage location for high-level codes
   D. A protocol for deleting data

6. What role does the compiler play in programming? (1)

   A. Converts high-level language into machine language
   B. Enhances the computer's audio system
   C. Connects the computer to the internet
   D. Powers the computer's central processing unit

7. Which of these describes 'cloud computing'? (1)

   A. Using local storage for saving data
   B. Using physical servers manually managed by users
   C. Using hardware to perform calculations
   D. Using internet-based services for storage and applications

8. What does the term bit signify in computing? (1)

   A. The speed of the processor
   B. The basic unit of information in computing and digital communications
   C. A type of memory storage device
   D. The brightness of the display

9. Which component is essential for building an Internet of Things (IoT) device? (1)

   A. A high-capacity external hard drive
   B. A microcontroller
   C. An audio output device
   D. A paper input tray

10. What is open sourc' software? (1)

    A. Software that is free to use, modify, and distribute
    B. Software that is sold commercially
    C. Software that cannot be modified
    D. Software that only allows viewing of its source code

11. What is the purpose of an Integrated Development Environment (IDE) in programming? (1)

    A. To provide a platform for building, testing, and debugging software
    B. To increase internet speed
    C. To connect various input devices
    D. To manage database systems

12. Which technology is used to create virtual or augmented realities? (1)

    A. Sensor technology
    B. Actuator systems
    C. 3D graphics programming
    D. Machine learning algorithms

13. What does UI stand for in technology, and what does it mean? (1)

A. User Interface; it refers to the graphical layout of an application
B. Unlimited Internet; it refers to unrestricted web access
C. Universal Input; it refers to a type of computer input
D. User Interaction; it refers to user responses within a program

14. Which of the following best describes data encryption? (1)

A. Compressing data to save space
B. Converting data into a secure format for protection
C. Transferring data from one computer to another
D. Deleting old data from a system

15. What is a protocol in computer networking? (1)

A. A device that boosts the network signal
B. A set of rules governing the exchange or transmission of data
C. A password used to access a network
D. A tool to measure data speed

16. Which of these is an example of a peripheral device? (1)

A. Motherboard
B. RAM
C. Printer
D. CPU

17. What role does artificial intelligence play in modern devices? (1)

A. It allows devices to perform tasks that typically require human intelligence
B. It decreases the functionality of devices to save energy
C. It replaces the need for internet connectivity
D. It prevents devices from overheating

18. In terms of internet security, what is a firewall? (1)

A. A physical barrier protecting a server
B. Software that protects a network from unauthorized access
C. A tool for speeding up the computer
D. A type of computer virus

19. What function does the algorithm perform in a search engine? (1)

A. It generates advertisements based on user data
B. It determines the most relevant results to display in response to a query
C. It tracks the number of people using the search engine
D. It measures the speed of the internet connection

20. Which device is essential for a computer to communicate over a telephone line? (1)

A. Router
B. Modem
C. Switch
D. Repeater

(20)

SECTION B: TRUE OR FALSE STATEMENTS

1. The Internet of Things (IoT) relies solely on wired connections to operate. (1)

   A. True
   B. False

2. A compiler translates a high-level programming language into a machine-readable format before execution. (1)

   A. True

   B. False

3. HTML stands for HyperText Markup Language and is used for creating and structuring parts of a website. (1)

   A. True

   B. False

4. Cloud computing requires physical storage devices on the user's premises to store data.. (1)

   A. True

   B. False

5. Artificial Intelligence can only be used in robotics and has no application in other fields. (1)

   A. True

   B. False

(5)

SECTION C: COMPUTATIONAL

'wait (0.5) seconds' block	'change colour effect by (25)' block
'when green flag clicked' block	'move (10) steps' block
'forever' block	'turn right (90 degrees)' block

1. Create a Scratch program where a sprite continuously changes its colour as it moves across the screen. Detail the steps and Scratch blocks you would use. (5)

2. Design a Scratch project where a sprite moves across the screen and changes its size when a key is pressed. (5)

'if on edge, bounce' block	'if key (space key) pressed then change size by 10%' block
'turn right (90 degrees)' block	'when green flag clicked' block
'move (10) steps' block	'forever' block'

(10)

SECTION D: PRACTICAL APPLICATION AND PROBLEM SOLVING

1. In a Scratch project, you are tasked to simulate a robot navigating through a maze. The robot should start at one end of the maze and move to the exit, avoiding walls. The robot should turn 90 degrees to the right when it encounters a wall. Order the blocks needed to create this simulation. Assign one mark for each correctly ordered code block. (7)

'move (10) steps' block	'forever' block
'turn right (90 degrees)' block	'if <touching [colour black]>' block
'move (-10 steps)' block	'end' block
'when green flag clicked' block	'turn right (180 degrees)' block

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2. In this Scratch project, create a game where a character moves horizontally across the screen to catch falling apples. If an apple reaches the bottom of the screen without being caught, the game ends. Sequence the following blocks correctly to construct the game. (8 marks)

'when green flag clicked' block	'if <left arrow key pressed>' block
'if <apple touching edge>' block	'change x by (10)' block
'if <right arrow key pressed>' block	'forever' block
'change x by (-10') block	'move (10) steps' block

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TOTAL MARKS = 50