CODING & ROBOTICS OLYMPIAD GRADE 6

DATE: 25 AUGUST 2026

TIME: 60 MINUTES

INSTRUCTIONS:

This booklet has multiple-choice questions, true or false questions, short answer questions, and practical and problem-solving questions.

The total of this booklet is out of fifty marks.

You have 60 minutes for the paper.

Read the questions carefully before answering.

Visit the website: www.saolympiads.co.za.

NAME OF LEARNER:	
SCHOOL:	**GRADE:**

SECTION A: MULTIPLE CHOICE QUESTIONS

1. What is the main function of a controller in a robotics system? (1)
   A. To supply electrical power
   B. To process inputs and control outputs
   C. To store permanent data
   D. To display information

2. Which concept is essential for writing efficient computer programmes? (1)
   A. Random guessing
   B. Logical thinking
   C. Painting graphics
   D. Typing speed

3. What is the purpose of a variable in a programme? (1)
   A. To repeat actions
   B. To stop a programme
   C. To display images
   D. To store values that may change

4. Which Scratch block structure allows a programme to make decisions repeatedly? (1)
   A. If block
   B. Repeat (10) block
   C. Forever loop with an if block
   D. Wait block

5. What does bandwidth refer to in networking? (1)
   A. The physical size of a cable
   B. The amount of data that can be transferred in a given time
   C. The number of connected devices
   D. The distance between devices

6. What role does an interpreter play in programming? (1)
   A. Translates and runs code line by line
   B. Designs user interfaces
   C. Stores programme files
   D. Improves computer performance

7. Which statement best describes cloud-based services? (1)
   A. Data is stored only on local computers
   B. Data and applications are accessed through the Internet
   C. Data can only be accessed offline
   D. Data must be stored on USB devices

8. What does a byte represent in computing? (1)
   A. A single instruction
   B. A group of eight bits
   C. The speed of a processor
   D. A type of network

9. Which programmable component is commonly embedded in a smart home system? (1)
   A. Microcontroller
   B. Spreadsheet software
   C. Printer driver
   D. Cooling fan

10. What does open-source software allow users to do? (1)
   A. View the programme but not change it
   B. Use the software for one device only
   C. Prevent others from accessing the code
   D. Modify and share the programme legally

11. Why is an Integrated Development Environment (IDE) useful to programmers? (1)
   A. It replaces the need for hardware
   B. It combines tools for writing, testing, and debugging programmes
   C. It increases Internet speed
   D. It stores personal data

12. Which technology is most responsible for creating interactive virtual environments? (1)
   A. Data encryption
   B. Sound engineering
   C. 3D graphics programming
   D. Network routing

13. What does UX focus on in software design? (1)
   A. Hardware performance
   B. Network security
   C. User experience and ease of use
   D. Data storage

14. What is the main purpose of data compression? (1)
   A. To make data more secure
   B. To delete unnecessary files
   C. To improve image colour
   D. To reduce file size

15. What is a network protocol? (1)
    A. A hardware device
    B. A set of rules for data communication
    C. A virus protection tool
    D. A data storage method

16. Which device is considered an external peripheral? (1)
    A. CPU
    B. RAM
    C. Keyboard
    D. Motherboard

17. How does machine learning differ from traditional programming? (1)
    A. Machines are manually programmed for every action
    B. Systems learn patterns from data
    C. No algorithms are used
    D. Computers do not require data

18. What is the purpose of a firewall in a network? (1)
    A. To block unauthorised access
    B. To speed up Internet access
    C. To store passwords
    D. To detect hardware faults

19. Why are algorithms important in recommendation systems? (1)
    A. They control screen brightness
    B. They select relevant content for users
    C. They store login details
    D. They manage power usage

20. Which device converts digital signals for transmission over telephone lines? (1)
    A. Router
    B. Modem
    C. Switch
    D. Access point

(20)

SECTION B: TRUE OR FALSE STATEMENTS

1. Wireless communication is commonly used in Internet of Things (IoT) systems. (1)
   A. True
   B. False
2. An interpreter must convert the entire programme before it can run. (1)
   A. True
   B. False
3. Cloud services always require users to own physical servers. (1)
   A. True
   B. False
4. Data encryption helps protect information from unauthorised access. (1)
   A. True
   B. False
5. Artificial intelligence can be applied in areas such as healthcare, transport, and education. (1)
   A. True
   B. False

(5)

(5)

SECTION C: COMPUTATIONAL

1. Create a Scratch programme where a sprite moves continuously while rotating and changes direction when it touches the edge of the screen. List the steps and blocks you would use.

'turn (15 degrees)' block	'move (10) steps' block
'forever' block	'if on edge, bounce' block
	'when green flag clicked' block

2. Design a Scratch programme where a sprite changes costume and plays a sound when a key is pressed. List the blocks used in order. (5)

'wait (0.5) seconds' block	'play sound' block
'next costume' block	'when key pressed' block
'when green flag clicked' block	

(10)

SECTION D: PRACTICAL APPLICATION AND PROBLEM SOLVING

(7)

1. In a Scratch project, programme a robot sprite to patrol an area and turn away when it detects an obstacle. Order the blocks needed to achieve this behaviour.

'turn right (90 degrees)' block	'if <touching obstacle>' block
'end if' block	'forever' block
'when green flag clicked' block	'wait (0.1) seconds' block
	'move (10) steps' block

2. Create a Scratch game where a player controls a character to avoid falling objects. If the character is hit, a 'Game over' message appears. Sequence the blocks correctly. (8)

'if <left arrow key pressed>' block	'forever' block
'change x by (10)' block	'if <right arrow key pressed>' block
'change x by (-10)' block	'if <object touching sprite>' block
'when green flag clicked' block	'say "Game Over" for 2 seconds' block

(15)

TOTAL MARKS = 50