Class 7

Answer Key

Computer Genius 2.1

1. Number System

LET'S RECAP (Page no. 7)

Do it yourself.

QUEST (Page no. 12)

1. $(1000.10)_2$

   $= 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 + 1 \times 2^{-1} + 0 \times 2^{-2}$

   $= 1 \times 8 + 0 + 0 + 0 + 1 \times 0.5 + 0$

   $= (8.5)_{10}$

2.

2	30	
2	15	–0
2	7	–1
2	3	–1
	1	–1

$(30)_{10} = (11110)_2$

EXERCISE

A. 1. (ii) 2. (i) 3. (ii) 4. (i) 5. (ii)

B. 1. T 2. F 3. T 4. T 5. T

C. 1. The octal number system consists of eight digits from 0 to 7. Hence, the base of octal number system is 8.

2. 4 bits

3. The total number of digits used in a number system is called its Base.

4. A number system is a collection of numbers used to describe various quantities. There are many number systems in existence. Consider a digital clock. Digital clocks have 24 hours, each hour composed of 60 minutes. Each minute is in turn composed of 60 seconds. When you learnt to count, you used the numbers, like 1, 2, 3, etc. Similarly, computers also have their own number system, known as the binary number system.

5. To convert a decimal number into a binary number, follow these steps:

   - Divide the decimal number by 2 (the base of the binary number system).

- Note down the quotient and the remainder.
- Divide the quotient obtained again by 2 and note down the resulting quotient and remainder.
- Repeat the procedure till you reach a quotient less than 2.
- List the last quotient and all the remainders (moving from bottom to top). You will get your binary number.

FUN ZONE

1. $(21)_{10}$
2. $(123)_{10}$
3. $(101101001)_{2}$
4. $(110)_{2}$
5. $(1100101)_{2}$
6. $(301)_{10}$
7. $(12)_{10}$
8. $(10100101)_{2}$
9. $(81)_{10}$
10. $(106)_{10}$

Competency-based/Application-based questions

1. $(256)_{8}$ Octal Number System
   $(2AF)_{16}$ Hexadecimal Number System
2. Hexadecimal Number System

2. App Development

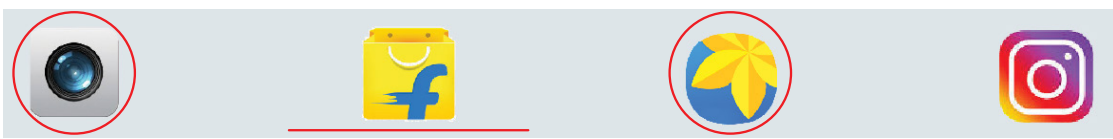
LET'S RECAP (Page no. 16)

Do it yourself.

QUEST (Page no. 17)

The application that is mainly developed for computer or laptop is called a desktop application whereas Web app is an application program that is stored on a remote server and accessed over the Internet through a Web browser interface.

QUEST (Page no. 19)



QUEST (Page no. 29)

The Project Designer Window in MIT App Inventor is used for designing the user interface (UI) of an app.

EXERCISE

A. 1. (i) 2. (i) 3. (i) 4. (i) 5. (iii)

B. 1. Hybrid 2. Desktop 3. iOS 4. Entertainment 5. install

C. 1. F 2. T 3. F 4. T 5. F

D. 1. An app is a software program primarily developed for hand-held smart devices such as mobile and tablet.

2. Web apps are essentially web applications that provide a user experience similar to native apps.
3. Native apps are platform dependent which means that these apps are primarily developed for a specific platform.
4. Backpack, Workspace, Trash
5. There are mainly three types of applications, which are:
   - Desktop: The application that is mainly developed for computer or laptop is called a desktop application.
   - Mobile: Mobile application (also known as mobile app) is software program that is developed for hand-held devices such as smartphones and tablets.
   - Web: A Web app is an application program that is stored on a remote server and accessed over the Internet through a Web browser interface.
6. To change the display name of button, follow the given steps:

   Step 1: Click on the button in the Viewer pane.

   Step 2: Type a new name for the button in the Text box.
7. Web apps are different from websites. The major difference is that a web app can be a small part of a website which provides a particular functionality. On the other hand, a website can contain many web apps.
8. Educational apps provide a platform for children to learn from anywhere and anytime. These apps use advance methodologies and new concepts to make the learning easier. The most commonly used educational apps are Khan Academy, Vedantu, and Learn English Grammar.

FUN ZONE

1. Web App 2. App Store 3. Hybrid App 4. Gaming Apps
5. Educational Apps 6. Social Networking Apps

Competency-based/Application-based questions

1. Gaming App
2. Trash

3. Advanced Features of Excel 2016

LET'S RECAP (Page no. 33)

1. T 2. T 3. F 4. F

QUEST Page no. 36)

1. Form 2. New 3. Close

QUEST Page no. 39)

1. T 2. T 3. F 4. T

EXERCISE

A. 1. (i) 2. (ii) 3. (ii) 4. (i)

B. 1. record 2. database 3. conditional formatting 4. subtotal 5. pivot table

C. 1. T 2. T 3. T 4. F 5. T

D. 1. Data validation means to restrict the user to enter a specific range of values in a particular cell or a range of cells.

2. Conditional formatting is used to apply formatting as per your need—such as font, colors, icons, etc.

3. Steps to search a particular record:

Step 1: Click on the Insert tab.

Step 2: Click on the Form command.

Step 3: Click on the Criteria button.

Step 4: Type the desired field value which you want to search and press the Enter key.

FUN ZONE

1. Data Validation 2. Filter 3. Conditional Formatting 4. Data Bars

Competency-based/Application-based questions

Top/Bottom Rules

Periodic Assessment 1

(Based on chapters 1 to 3)

A. 1. Uber, Calculator 2. Blinkit, Paytm 3. YouTube, Netflix 4. Facebook, LinkedIn
5. OLX, Flipkart

B. 1. Decimal Octal Scientific Binary

2. Int Bit Nibble Byte

C. 1. (c) 2. (e) 3. (b) 4. (a) 5. (d)

D. 1. Data validation means to restrict the user to enter a specific range of values in a particular cell or a range of cells.
2. The Pivot Table feature of Excel 2016 allows you to analyse the large amount of data.
3. Conditional Formatting command is present under Home tab.

4. Coding and Flowchart

LET'S RECAP (Page no. 47)

Step 1: Start
Step 2: Take given number, n
Step 3: Check whether n is divisible by 2 or not
Step 4: If it is, print "n is an even number", otherwise print "n is an odd number"
Step 5: Stop

QUEST (Page no. 50)

1. It is used to show the start and stop points of the flowchart.
2. It shows a process or action step.

EXERCISE

A. 1. (iii) 2. (ii) 3. (i)

B. 1. Algorithm
2. Arrows
3. Parallelogram

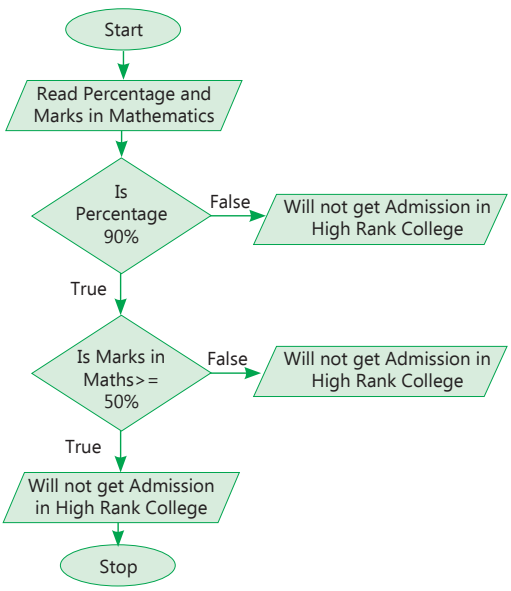
C. 1. (b) 2. (a) 3. (d) 4. (e) 5. (c)

D. 1. A flowchart is a diagrammatic representation of the step-by-step plan that is supposed to be followed, for solving a task/problem statement.

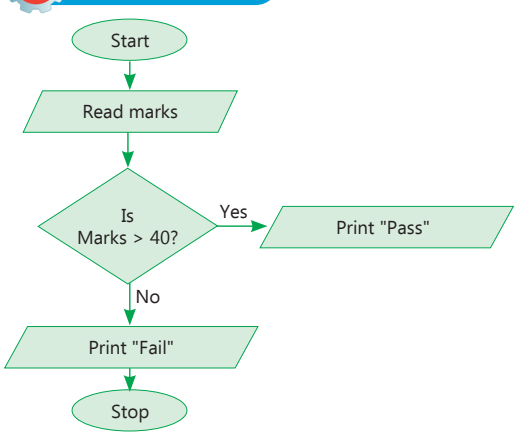
2. Following are the benefits of flowchart:
   - Effective Communication: Flowcharts are better way of communicating the logic of the system.
   - Effective Analysis: Using flowchart problem can be analysed more efficiently.

3 There are certain principles to be followed while drawing flowcharts:
   - Marking the start and end points clearly.
   - Using standard symbols.
   - Avoiding crossed lines.
   - Using simple decisions.
   - Working in a consistent direction.

4.



FUN ZONE



Competency-based/Application-based questions

1. Parallelogram
2. Rectangle
3. Parallelogram

5. Advanced MakeCode Arcade

LET'S RECAP (Page no. 54)

Step 1: Input a number (Num)
Step 2: If Num is less than 2
Step 3: Print "It's not a prime number"
Step 4: For each whole number i from 2 to Num - 1
Step 5: If Num is divisible evenly by i
Step 6: Print "It's not a prime number"
Step 7: Exit the loop
Step 8: Print "It's a prime number"

QUEST (Page no. 68)

1. The main purpose of using functions is to get rid of the repetitive block of code.

2. Parameters are variables defined in a function's definition as placeholders, while arguments are the actual values passed to the function when it's called.

EXERCISE

A.

1. (iv)	2. (iv)	3. (ii)	4. (ii)	5. (iii)

B.

1. Loop	2. While	3. Forever	4. Break	5. Function

C.

1. T	2. F	3. T	4. F	5. T

D.

1. Loops are used to repeat a block of code multiple times, which helps in reducing code repetition, increasing efficiency, and making the program easier to manage.
2. The break statement is used to exit a loop before it finishes all its iterations, usually when a specific condition is met.
3. Functions help organize code into smaller, reusable blocks, making the program more readable, easier to debug, and reducing repetition.
4. Parameters are variables listed in a function's definition as placeholders. Arguments are the actual values passed to the function when it is called.
5. In MakeCode Arcade, you create a function by clicking on the Functions category, selecting "Make a Function", giving it a name, and then adding blocks inside it. You can also add parameters to make the function accept inputs. Later, you can call this function from other parts of your program.

FUN ZONE

A. 1.
```
let n = 0
for (let index = 0; index < 3; index++) {
    n += 1
}
game.splash(n)
```
2.
```
let score = 0
while (true) {
    score += 10
    if (score >= 50) {
        break;
    }
}
game.splash("Congratulations! You've reached a score of" + score)
```
3.
```
for (let i = 0; i <= 4; i++) {
    if (i % 2 == 0) {
        game.splash("" + i + "is even ")
    } else {
        game.splash("" + i + "is odd")
    }
}
```
4.
```
Input first number (Num2)
Input second number (Num1)
Sum = Num1 + Num2
Print Sum
```

Competency-based/Application-based questions

1. Swarna can use loops and functions.
2. Maya can create a function for each shape's area calculation.

6. Fields Where Robots are Used

LET'S RECAP (Page no. 73)

Do it yourself.

QUEST (Page no. 74)

Do it yourself.

QUEST (Page no. 77)

Da Vinci is a complete surgical system which performs complex surgeries with great skills of heart, head, neck and other sensitive areas.

QUEST (Page no. 79)

1. (c) 2. (d) 3. (b) 4. (a)

EXERCISE

A. 1. (i) 2. (iv) 3. (iii) 4. (i) 5. (ii)

B. 1. security 2. Nadine 3. Gravity 4. Material handling 5. Shipwreck

C. 1. T 2. F 3. T 4. T 5. F

D. 1. (b) 2. (a) 3. (e) 4. (c) 5. (d)

E. 1. Merlin and Root AI

2. Manufacturing robots

3. Two uses of robots in healthcare are as follows:
   - Surgical robots help doctors in performing surgery in healthcare field.
   - They are also used as prosthetic limbs.

4. NASA has made a number of robotic devices to support or substitute astronauts to perform high risk tasks. DARPA is a humanoid robot that can function like humans. Currently R1 and R2 are working as Robonaut. Robonaut 2 or R2 was the first humanoid robot sent to space as a part of STS-133 mission. RASSOR (pronounced as "Razor") is a lunar robot, Spidernaut is a robot constructed for maintenance and repair projects in space.

FUN ZONE

1. Customer service
2. Security and Surveillance
3. Space Exploration
4. Underwater Research

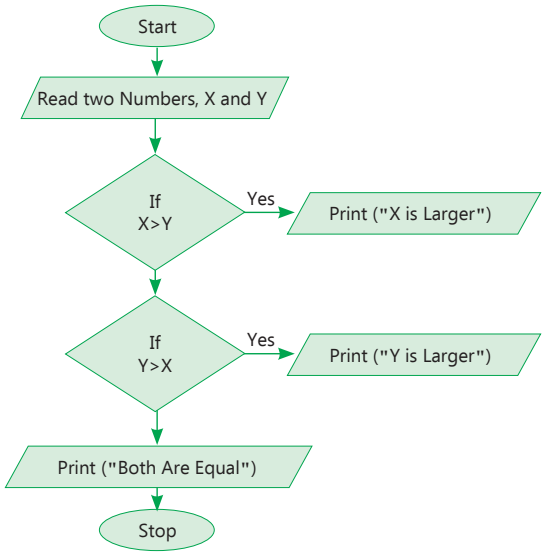
Competency-based/Application-based questions

1. Do it yourself.

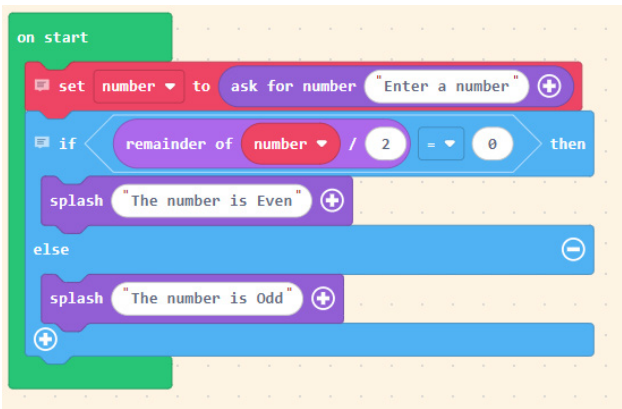
Periodic Assessment 2

(Based on chapters 4 to 6)

A.



B.



C.

1. Robots can be deployed as security guards to protect humans.
2. Unimate was the first robot joined the assembly line in 1961.
3. Suzumo Sushi Chef prepares Japanese food.
4. Surgical robots help doctors in performing surgery in healthcare field.
5. Spidernaut is a robot constructed for maintenance and repair projects in space.

Test Sheet 1

(Based on chapters 1 to 6)

A. 1. (i) 2. (i) 3. (i) 4. (ii) 5. (i) 6. (ii) 7. (iv) 8. (iv)

B. 1. hybrid 2. entertainment 3. record 4. subtotal 5. Parallelogram 6. Gravity

C. 1. F 2. T 3. F 4. T 5. T 6. T

D. 1. (b) 2. (a) 3. (d) 4. (e) 5. (c)

E. 1. The octal number system consists of eight digits from 0 to 7. Hence, the base of octal number system is 8.

2. Web apps are actually web applications which give a user experience similar to native apps.

3. Steps to search a particular record:

   Step 1: Click on the Insert tab.

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4. Following are the benefits of flowchart:
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6. NASA has made a number of robotic devices to support or substitute astronauts to perform high risk tasks. DARPA is a humanoid robot that can function like humans. Currently R1 and R2 are working as Robonaut. Robonaut 2 or R2 was the first humanoid robot sent to space as a part of STS-133 mission. RASSOR (pronounced as "Razor") is a lunar robot, Spidernaut is a robot constructed for maintenance and repair projects in space.

7. Exploring Math with Coding

LET'S RECAP (Page no. 88)

1. 9 2. 56 3. 96 4 856 5. 853

QUEST (Page no. 92)

1. OR block 2. NOT EQUAL block 3. GREATER THAN OR EQUAL TO block
4. if-do block

EXERCISE

A. 1. (iv) 2. (iii) 3. (i) 4. (i)

B. 1. AND 2. Relational 3. 90 4. Not Equals to

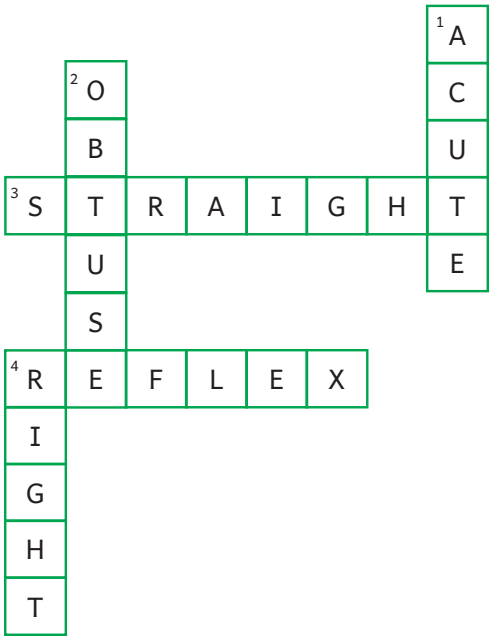
C. 1. (b) 2. (a) 3. (d) 4. (c)

D. 1. If statement is a Conditional statement that help us direct the computer what to do and when

to do it. Conditions are the main part of the decision making process for computers.

2. < operator (strictly less than operator) shows the condition is true if the left value is less than the right value whereas <= operator (less than or equal to operator) shows the condition is true if the left value is less than or equal to the right value.
3. "and" operator is used to show when both conditions are true whereas "or" operator is used when one of two conditions is true.
4. When an angle measures more than 90 degrees, it is called an 'Obtuse' angle.

FUN ZONE



Competency-based/Application-based questions

1. By clicking on Setting button of if-do block and add else block in if-do block.
2. Equal operator or Not Equal operator.

8. Exploring Science with Coding-1

LET'S RECAP (Page no. 98)

1. conditional 2. Relational 3. obtuse 4. greater than or equal to

CODE QUEST (Page no. 106)

1. Speed= Distance / Time
2. Average Speed = Total Distance Travelled / Total Time Taken
3. Distance = Speed * Time

EXERCISE

A. 1. (ii) 2. (iii) 3. (iv) 4. (i)

B. 1. average speed 2. addition 3. time

C. 1. T 2. F 3. F 4. F

D. 1. Speed is defined as the distance travelled by an object divided by the time taken to cover the distance.

Speed= Distance / Time

2. Division operator is used to perform the mathematical division of two variables whereas modulus operator is used to perform the mathematical remainder of two variables.

In programming, we refer to '/' as a symbol of division whereas '%' as a symbol of modulus.

3. 1 km/hr = 5/18 m/s

10 km/hr = 10 x (5/18) m/s = 2.78 m/s

FUN ZONE

Total distance travelled by the vehicle is 24 km

Total time taken by the vehicle is 2 hr

The speed of the vehicle is 12 km/hr

Competency-based/Application-based questions

1. Addition block
2. Distance = Speed x Time

9. Exploring Science with Coding-2

LET'S RECAP (Page no. 109)

1. Variable 2. Integer 3. Speed

QUEST (Page no. 114)

Temperature of the area is 35

The weather is warm.

EXERCISE

A. 1. (iii) 2. (i) 3. (i)

B. 1. temperature 2. Force 3. elif 4. neutral

C. 1. The elif keyword is python's way of saying, if the previous conditions were not true, then try this condition.

2. acceleration = 3
   force = 3900
   mass = force / acceleration
   print('The mass of the car is ', mass, 'kg')

FUN ZONE

1. The force to accelerate the car is 7500 N
2. The acceleration of the car is 4 N

Competency-based/Application-based questions

1. elif keyword
2. Neutral

Periodic Assessment 3

(Based on chapters 7 to 9)

A. 1. It is used when both conditions are true.
2. It is used when one of two conditions is true.
3. This condition is true if both the values are not equal.
4. This condition is true if the left value is less than or equal to the right value.

B. 1. (d) 2. (a) 3. (e) 4. (b) 5. (c)

C. Given Solution is Acidic
pH is 0 to 6

10. AI in Real World

LET'S RECAP (Page no. 121)

1. Sunglasses worn 2. No sunglasses 3. No sunglasses 4. Sunglasses worn

QUEST (Page no. 126)

1. F 2. T 3. T 4. F

EXERCISE

A. 1. (iv) 2. (ii)

B. 1. Aadhaar cards, smart phones.

2. Drag and drop Get face count block from Facial Features sub-category. Then, click on arrow of Get face count block and select eye to make it Get eye count block.

FUN ZONE

Get eye count == 0, means the person's eyes in the image are not visible.

Textual code: (facialfeature.eyecount(image)) == 0

Competency-based/Application-based questions

1. By clicking on arrow of Get face count block and selecting smile.
2. Biometrics that are used in it are fingerprint, iris(eye) and facial image.

11. Textual Coding

LET'S RECAP (Page no. 128)

Step 1: Start
Step 2: Read given four numbers, w, x, y, z
Step 3: a = w + x+ y + z
Step 4: print a
Step 5: Stop

QUEST (Page no. 135)

1. 1
2. Ravi is 13 years old.

EXERCISE

A. 1. (ii) 2. (iv) 3. (iii) 4. (i)

B. 1. Syntax 2. input 3. Variables

C. 1. Block based coding consists of easy to use block based interface whereas text-based coding involves writing lines of code.

Block coding is the basic form of computers programming and a great way to start learning coding whereas text-based coding should be introduced when one got used to block based coding.

With block code one can learn the programming logic and design better whereas in text-based coding it is essentially typing instructions in a programming language with a syntax.

2. A variable is created when a value is assigned with the help of an assignment operator (=).
   For example:
   name = 'Ravi'
3. `age = int(13)`
   `print('My age is ', age, ' years old.')`

FUN ZONE

1. Uday got 107 rupees.
2. Lakshay Singh

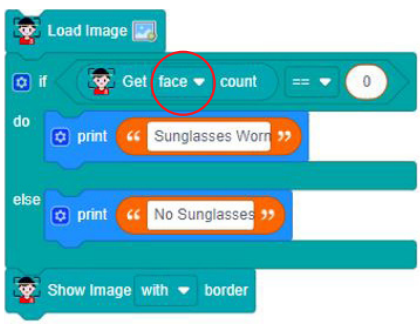
Competency-based/Application-based questions

1. `x = input('Write something: ')`
   `print(x)`
2. `print()` function

Periodic Assessment 4

(Based on chapters 10 & 11)

A.



Click on arrow of Get face count block and select eye to make it Get eye count block.

B.
1. T = 0
2. print()
3. float(0)
4. Hello = input('What is your name?')
   print(Hello)

C.
```
date = int(10)
month = 'March'
year = int(2011)
print('My date of birth is', date, 'th', month + ',', year, '.')
```

Test Sheet 2

(Based on chapters 7 to 11)

Section A

A. 1. (iii) 2. (i) 3. (iv) 4. (i) 5. (i) 6. (i) 7. (ii) 8. (i)

B. 1. AND 2. Relational 3. addition 4. time 5. Force 6. Syntax 7. input

C. 1. (b) 2. (a) 3. (d) 4. (c)

D. 1. T 2. F 3. F 4. F

E.

1. "and" operator is used to show when both conditions are true whereas "or" operator is used when one of two conditions is true.
2. If statement is a Conditional statement that help us direct the computer what to do and when to do it. Conditions are the main part of the decision making process for computers.
3. Division operator is used to perform the mathematical division of two variables whereas modulus operator is used to perform the mathematical remainder of two variables.

   In programming, we refer to '/' as a symbol of division whereas '%' as a symbol of modulus.
4. The elif keyword is python's way of saying , if the previous conditions were not true, then try this condition.
5. Aadhaar cards, smart phones.
6. Drag and drop Get face count block from Facial Features sub-category. Then, click on arrow of Get face count block and select eye to make it Get eye count block.
7. A variable is created when a value is assigned with the help of an assignment operator (=).

   For example: name = 'Ravi'