Grade 9 Computer, Explained

# Final Exam Model Paper 1

**ANSWER KEY**

Full marks 50 · 2 hours

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

A practice paper by Science Playground, made to CDC's Specification Grid, Computer Science, Grade 9 (2082); not an official CDC or exam board paper.

## Group A

**10 × 1 = 10**

1. **(ii)** SRAM
2. **(ii)** 512
3. **(ii)** a solid state drive (SSD) in place of the hard disk
4. **(iii)** the stage
5. **(ii)** to control how the page looks: its colors, fonts, spacing and layout
6. **(iii)** C
7. **(iii)** SMTP
8. **(iii)** Not tap the link or give his PIN; check in the official eSewa app himself, and report the message.
9. **(ii)** ==
10. **(i)** 3 2

## Group B

**10 × 2 = 20**

**11.** **[2]**

| RAM | ROM |
|---|---|
| Volatile: everything in it is lost when the power goes off. | Non-volatile: it keeps its contents without power. |
| Read/write memory: the CPU can both read from it and write to it. | Read only: its contents can be read but not changed in ordinary use. |
| Holds the programs and data being used now. | Holds fixed instructions such as the BIOS, which starts the computer. |
| Its contents change all the time while the computer works. | Its contents are written in by the manufacturer. |

(Any two.)

**Marking scheme**

- One correct difference with both sides (e.g. RAM volatile / ROM non-volatile).
- A second correct difference (e.g. RAM read and write / ROM read only; programs in use / the BIOS).

**12.** **[2]**

a. **HDMI** (High Definition Multimedia Interface): it carries high-definition video and sound together on a single cable. (VGA carries only analog video.)

b. **Ethernet** (an RJ-45 socket): it joins a computer to a wired LAN with a network cable.

**Marking scheme**

- a. HDMI, because it carries video and sound together on one cable.
- b. Ethernet (RJ-45), because it connects a computer to a wired LAN.

**13.** **[2]**

a. Multiply each digit by its place value and add:

$1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 32 + 16 + 0 + 4 + 0 + 1 = 53$

So $(110101)_2$ = **$(53)_{10}$**.

b. Divide by 2 until the quotient is 0, and read the remainders from the bottom up:

| 2 | Number | Remainder |
|---|---|---|
| 2 | 58 | 0 |



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| 2 | Number | Remainder |
|---|---|---|
| 2 | 29 | 1 |
| 2 | 14 | 0 |
| 2 | 7 | 1 |
| 2 | 3 | 1 |
| | 1 | 1 |

So $(58)_{10}$ = **$(111010)_2$**. Check: 32 + 16 + 8 + 2 = 58.

**Marking scheme**

- a. Place values shown and $(53)_{10}$.
- b. Repeated division by 2 shown and $(111010)_2$.

**14.** a. **[2]**

```
  1 1 0 1 1
+   1 1 0 1
-----------
1 0 1 0 0 0
```

Working from the right: 1 + 1 = 10 (write 0, carry 1); 1 + 0 + 1 = 10 (0, carry 1); 0 + 1 + 1 = 10 (0, carry 1); 1 + 1 + 1 = 11 (1, carry 1); 1 + 1 = 10 (0, carry 1); the last carry is written in front. So the sum is **$(101000)_2$**. Check: 27 + 13 = 40.

b.

```
  1 1 0 1 0
-     1 1 1
-----------
  1 0 0 1 1
```

From the right: 0 − 1 borrows from the 1 next to it (10 − 1 = 1); that column is now 0, and 0 − 1 borrows again, from the 1 two places on, through the 0 between, which becomes 1 (10 − 1 = 1); the middle column is then 1 − 1 = 0; the column that lent is 0 − 0 = 0; the first 1 stays. So the difference is **$(10011)_2$**. Check: 26 − 7 = 19.

**Marking scheme**

- a. $(101000)_2$, with the carries shown.
- b. $(10011)_2$, with the borrows shown.

**15.** **[2]**

```
<h2>Places to visit in Pokhara</h2>
<ol>
  <li>Phewa Lake</li>
  <li>Sarangkot</li>
  <li>Davis Falls</li>
</ol>
```

The browser shows the heading in bold, larger than the text, and the three places numbered 1, 2 and 3.

**Marking scheme**

- The heading in `<h2> … </h2>`.
- The ordered list: `<ol>` … `</ol>` with each place in its own `<li>` … `</li>`.

**16.** **[2]**

| HTTP | HTTPS |
|---|---|
| Hypertext Transfer Protocol. | Hypertext Transfer Protocol Secure. |
| Sends data as plain text, which anyone on the way can read. | Encrypts (scrambles) the data, so nobody on the way can read or change it. |


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| HTTP | HTTPS |
|---|---|
| Doesn't prove which website you are talking to. | The server shows a certificate that proves it is the website it claims to be. |
| The address begins `http://`, and the browser says "Not secure". | The address begins `https://`, and the browser shows a padlock. |
| Not fit for passwords and payments. | Used for logins, banking and payments. |

(Any two.)

**Marking scheme**

- One correct difference with both sides (e.g. plain text / encrypted).
- A second correct difference (e.g. no certificate / a certificate; http:// / https:// with a padlock).

**17.** Any two, each with its reason: **[2]**

- **Don't post photos of documents.** An admit card shows her name, photo, school and date of birth together; a stranger could use them to pretend to be her (identity theft) or to trick her or her friends.
- **Keep the account private**, and accept only people she knows in real life, because a public post can be seen, copied and shared by anyone.
- **Think before posting.** A post can be copied and kept forever, even after it is deleted, so share the happy news in words, or a photo with no details on it.
- **Keep private things private**: her school, her routine and where she is, so that nobody can find or follow her.

**Marking scheme**

- First advice with its reason (e.g. no photos of documents: they can be used to steal her identity).
- Second advice with its reason (e.g. a private account / think before posting, since posts can be copied and kept forever).

**18.** An **identifier** is a name a programmer gives to something in a program, such as a variable: `total_marks`, `name`. **[2]**

Rules (any two):

- It must start with a letter or an underscore _, never a digit.
- It may contain only letters, digits and underscores: no spaces or other symbols such as `-` or `@`.
- It can't be a Python keyword such as `if` or `while`.
- It is case-sensitive: `age` and `Age` are different identifiers.

**Marking scheme**

- Identifier: a name given to a variable (or other item) in a program.
- Two correct rules.

**19.** **[2]**

| n (at the check) | n > 0 | d = n % 10 | s = s + d | n = n // 10 |
|---|---|---|---|---|
| 472 | True | 2 | 2 | 47 |
| 47 | True | 7 | 9 | 4 |
| 4 | True | 4 | 13 | 0 |
| 0 | False | (loop ends) | | |

```
n = 472
s = 0
while n > 0:
    d = n % 10
    s = s + d
    n = n // 10
print("Sum of digits:", s)
```

OUTPUT



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```
Sum of digits: 13
```

`n % 10` takes the last digit and `n // 10` drops it, so the loop adds 2, 7 and 4.

**Marking scheme**

- A correct dry-run table (d, s and n for each time round the loop).
- The output: `Sum of digits: 13`.

**20.** [2]

```
1  length = float(input("Length of the plot (m): "))
2  breadth = float(input("Breadth of the plot (m): "))
3  area = length * breadth
4  fence = 2 * (length + breadth)
5  print("Area:", area, "square meters")
6  print("Fence needed:", fence, "meters")
```

OUTPUT

```
Length of the plot (m): 12
Breadth of the plot (m): 8
Area: 96.0 square meters
Fence needed: 40.0 meters
```

(Any correct program.)

**Marking scheme**

- The length and breadth read with `float(input())` (or `int`).
- Area = length × breadth and fence = 2 × (length + breadth), both displayed.

## Group C — 5 × 4 = 20

**21.** **Software** is the set of instructions, programs and data that tells a computer what to do. It is the intangible part of a computer: it can't be touched. [4]

Kinds of system software (any three):

- **Operating system:** controls and manages the whole working of the computer (programs, memory, files and devices) and gives the user an interface. Examples: Windows, Linux, Android.
- **Language processor (translator):** translates programs written in assembly or a high-level language into machine language: an assembler, a compiler or an interpreter.
- **Utility software:** maintains the computer and its data: antivirus, backup, file compression and disk defragmenter programs.
- **Device driver:** a program that controls one particular device, such as a printer, so that the operating system can use it.

**Marking scheme**

- Software: the instructions and programs that tell a computer what to do (the intangible part).
- The first kind of system software, with what it does (e.g. the operating system manages the computer).
- The second (e.g. a language processor translates programs into machine language).
- The third (e.g. utility software maintains the computer: antivirus, backup).

**22.** **3, 4, 1, 2**: [4]

- 3, **when space key pressed** (Events): a hat block, the only kind that can start a script, so it goes on top.
- 4, **turn ↻ 15 degrees** (Motion).
- 1, **say Namaste! for 2 seconds** (Looks).
- 2, **play sound Meow until done** (Sound).



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**Figure 2** The four blocks in their right order.

**Marking scheme**

- Block 3 (when space key pressed) first, on top.
- Block 4 (turn 15 degrees) second.
- Block 1 (say Namaste! for 2 seconds) third.
- Block 2 (play sound Meow until done) last.

**23.** **[4]**

```
<form name="fair" method="post">
  Full name: <input type="text" name="fullname"><br><br>
  Event:
  <input type="radio" name="event" value="quiz"> Quiz
  <input type="radio" name="event" value="poster"> Poster<br><br>
  <input type="submit" value="Submit">
  <input type="reset" value="Reset">
</form>
```

The two radio buttons share `name="event"`, so choosing one clears the other. `<br>` puts each part on its own line. (`<label>` tags, or `<button>` for the buttons, are also correct.)

**Marking scheme**

- The `<form>` tag opened and closed, with the other tags inside it.
- A text box for the full name: `<input type="text">`.
- Two radio buttons, Quiz and Poster, with the same `name`.
- The Submit and Reset buttons: `<input type="submit">` and `<input type="reset">`.

**24.** **Malware** (malicious software) is any program written to do harm to a computer or its user: to damage, steal, spy or take control, put on a device without the owner's permission. **[4]**

Any three:

- **Virus:** attaches itself to a program or file and runs when that is opened; it may delete or damage files, and spreads with the files it is in (pen drives, downloads, attachments).
- **Worm:** copies itself from computer to computer **by itself**, through a network, using holes in software that isn't updated.
- **Trojan horse:** pretends to be a useful program, such as a free game, but does harm once the user installs it, often letting an attacker in.
- **Ransomware:** encrypts the user's files and demands money for the key.
- **Spyware:** secretly watches what the user does and sends it to someone; a keylogger records every key pressed, passwords included.
- **Adware:** floods the device with advertisements, often slowing it down.

**Marking scheme**

- Malware: software written to harm a computer or its user (damage, steal, spy).
- The first kind explained (e.g. a virus attaches to files and runs when they are opened).
- The second (e.g. a worm spreads by itself through a network).
- The third (e.g. a Trojan horse pretends to be a useful program).


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**25.** **[4]**

```python
# Input: the hours parked
hours = int(input("Enter the hours parked: "))
# Work out the charge from the table
if hours <= 1:
    charge = 20             # the minimum charge
elif hours <= 3:
    charge = hours * 25
else:
    charge = hours * 40
# Output: the charge
print("Parking charge = Rs", charge)
```

**OUTPUT**

```
Enter the hours parked: 4
Parking charge = Rs 160
```

Each band: 1 hour gives Rs 20, 3 hours 3 × 25 = Rs 75, 4 hours 4 × 40 = Rs 160. (Any correct program.)

**Marking scheme**

- The hours read with `int(input())`.
- The conditions with `if`, `elif` and `else` in the right order.
- The charge worked out correctly in each branch (20, hours × 25, hours × 40).
- The charge displayed.



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