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மத்திய மாகாண கல்வித் திணைக்களம்
DEPARTMENT OF EDUCATION - CENTRAL PROVINCE

G.C.E.(A/L) Practice Test- 2026

Information & Communication technology	20	E	I	Grade 13	2 Hours

Instructions:

- *Answer all the questions*
- *Write your **Index Number** in the space provided in the answer sheet.*
- *Instructions are also given on the back of the answer sheet. Follow those carefully*
- *In each of the questions **1 to 50** pick one of the alternatives from (1), (2), (3), (4), (5) which correct or **most appropriate** and **mark your response on the answer sheet with a cross (X)** in accordance with the instructions given on the back of the answer sheet.*
- *Use of calculators is **not allowed.***

1. Which of the following sequence displays the correct path of data transforming into wisdom?
   (1) Information → Data → Wisdom → Knowledge
   (2) Data → Information → Knowledge → Wisdom
   (3) Data → Knowledge → Information → Wisdom
   (4) Knowledge → Data → Information → Wisdom.
   (5) Wisdom → Knowledge →Information → Data

2. Which of the following is **not** a phase of the data life cycle?
   (1) Data Collection (2) Data Processing (3) Data Visualization
   (4) Data Storage (5) Data Creation

3. Which generation of computers introduced microprocessors?
   (1) First (2) Second (3) Third (4) Fourth (5) Fifth

4. A computer system stores text using character sets. Which of the following statements about ASCII and UNICODE is **true**?
   (1) ASCII can represent all global characters.
   (2) Unicode uses a fixed number of bits for every character.
   (3) ASCII is limited to representing 128 different characters.
   (4) Unicode is older than ASCII.
   (5) ASCII represents decimal numbers only.

5. The binary addition 1101 + 1011 gives:
   (1) 10100 (2) 11000 (3) 11001 (4) 11100 (5) 10000

6. The complement of A·B + C is:
   (1) (A'+B')·C' (2)(A'+B') + C' (3) A'·B' + C'
   (4) (A'·B')·C' (5) A'·B'·C'

7. A logic gate outputs 1 only when both of its two inputs are 1. What is the name of this logic gate?
   (1) NOT (2) OR (3) XOR (4) AND (5) NOR

See page two

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8. A Karnaugh map for a function F (A, B, C) is given below:

AB	00	01	11	10
C=0	1	1	1	0
C=1	1	1	1	0

What is the simplest Boolean expression for F?

(1) $F = C + B$ (2) $F = A + \bar{B}$
(3) $F = B + AC$ (4) $F = C + AB$
(5) $F = \bar{A} + B$

9. Which of the following statement/s is/are **incorrect**?
   I. The binary number 1001_2 equals 11 in decimal.
   II. The hexadecimal number A3 represents 244_8.
   III. The octal number 64 equals 53 in decimal.

(1) I only (2) I and II only (3) II and III only
(4) I and III only (5) All I, II, and III

10. During a data entry process for a "Monthly Salary" field, a user accidentally enters "45OO0" (using the letter 'O' instead of zero). The system immediately rejects the entry. Which validation method caught this error?

(1) Range check (2) Presence check (3) Data type check
(4) Batch check (5) Parity check

11. Which of the following is an example of an Open-Source Operating System?

(1) Windows 11 (2) macOS (3)Ubuntu
(4) iOS (5) DOS

12. In process management, what is the state of a process that is waiting for an I/O operation to complete?

(1) New (2) Blocked (3) Ready (4) Running (5)terminated

13. The primary role of the File Allocation Table (FAT) in a file system?

(1) To encrypt user data for secure storage.
(2) To keep track of which clusters belong to which files and identify free space.
(3) To manage the CPU's processing speed during file transfer.
(4) To provide a graphical interface for the user to browse folders.
(5) To compress large files automatically to save disk space.

14. A device that converts analog signals to digital signals and vice versa is called

(1) Router (2) Modem (3) Switch (4) Hub (5) Repeater

15. Which memory is non-volatile and can be electrically erased and reprogrammed?

(1) RAM (2) Cache (3) DRAM (4) EEPROM (5) SRAM

16. In networking, collision occurs most often in ..... topology.

(1) Star (2) Mesh (3) Bus (4) Ring (5) Tree

17. A school wants to build a local network that allows all computers to communicate but does not rely on a central device; if one computer fails, the rest of the network continues to function. Which network topology would be the most suitable choice?

(1) Bus (2) Star (3) ring (4) Tree (5) Mesh

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18. Which of the following is a legal risk associated with using 'Unlicensed' or pirated software?
    A. Enhanced data privacy for the user.
    B. Increased performance.
    C. Heavy fines
    (1) A only. (2) B only (3) C only.
    (4) A and B only. (5) A and C only

19. Which of the following correctly lists components of a data communication system?
    (1) message, sender, receiver, transmission medium, protocol
    (2) message, sender, receiver, internet, transmission medium
    (3) message, server, sender, receiver, transmission medium
    (4) message, modem, sender, receiver, protocol
    (5) client, sender, transmission medium, protocol

20. Which of the following statement is **false** regarding IP addresses?
    (1) 255.255.0.0. is the default subnet mask for a Class B IP address.
    (2) 1.0.0.0 – 126.255.255.255 ranges belong to Class A.
    (3) Class E is reserved for experimental and future use.
    (4) 192.168.1.1 is a valid Class B IP address
    (5) Class D is reserved for multicast groups.

21. Which of the following is NOT a standard phase in the Systems Development Life Cycle?
    (1) System Analysis (2) System Design (3) Maintenance
    (4) System Marketing (5) Implementation

22. Agile methodology emphasizes
    (1) Rigid planning and documentation (2) Fixed requirements from the start
    (3) Incremental development (4) initial customer collaboration
    (5) Sequential phases with no overlap

23. In a relational database, a primary key must be
    (1) Numeric only (2) Unique and not null
    (3) The first column of the table (4) A foreign key in another table
    (5) Null

24. The SQL command to remove a table from a database is
    (1) DELETE TABLE (2) REMOVE TABLE
    (3) DROP TABLE (4) ERASE TABLE
    (5) TRUNCATE TABLE

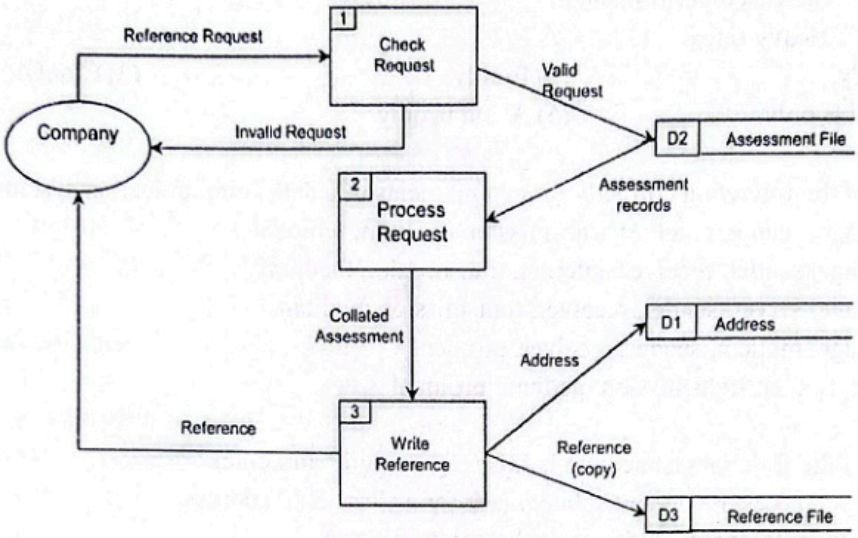
25. Which normal form eliminates partial dependencies?
    (1) 1NF (2) 2NF (3) 3NF (4) BCNF (5)4NF

26. The phase of the SDLC where the actual software and hardware are purchased or built, and the system is put into use is called
    (1) Planning (2) Analysis (3) Design
    (4) Maintenance (5) Implementation

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The following questions from 27 to 30 are based on the given data flow diagram below.



27. Which of the following is an external entity in the DFD?
(1) Process Request (2) Company (3) Collated Assessment
(4) D3 Reference File (5) Write Reference

28. What happens to an invalid request?
(1) It goes to Process Request (2) It goes to Company
(3) It goes to Address data store (4) It goes to Collated Assessment
(5) It goes to Check Request

29. Which of the following statement/s is/are **true** about the above DFD?
D. There are three data stores.
E. There are three external entities.
F. There are three processes.
(2) A only. (2) B only (3) C only.
(4) A and B only. (5) A and C only

30. The data flow "Valid Request" moves from
(1) Company to Process 1 (2) Process 1 to Process 2
(3) Process 2 to Process 3 (4) Process 3 to Company
(5) Process 3 to Process 1

31. A database administrator is designing a new database and wants to remove redundant data and improve data integrity. This process is known as
(1) Normalization (2) Data Encryption (3) Data Duplication
(4) Data Aggregation (5) Indexing

32. A company uses a system that allows customers to browse products, select them, and pay online without any human interaction. This business model is best described as
(1) E-Government (2) E-Learning (3)B2B
(4) C2C (5) B2C

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33. Consider the following relational schema:
Student (StudentID, Name, Address, City)
Course (CourseCode, Title, Credits)
Enroll (StudentID, CourseCode, Grade)
Which of the following is the correct SQL statement to find the names of students who have enrolled in the course titled "Database Systems"?
(1) SELECT S.Name FROM Student S JOIN Enroll E ON S.StudentID = E.StudentID JOIN Course C ON E.CourseCode = C.CourseCode WHERE C.Title = 'Database Systems';
(2) SELECT Name FROM Student, Course WHERE Title = 'Database Systems';
(3) SELECT Name FROM Student JOIN Enroll E ON StudentID = E.StudentID JOIN Course C ON E.CourseCode = C.CourseCode WHERE Course.title = "Database Systems";
(4) Select name FROM Student, Title from Course where Course.Title ="Database Systems" AND Course.CourseCode=Enroll.CourseCode;
(5) SELECT Name FROM Student, Enroll WHERE Student.StudentID = Enroll.StudentID AND CourseCode = 'Database Systems';

34. Which of the following is an example of C2C e-commerce?
(1) Amazon selling books
(2) eBay auctions between individuals
(3) Government tax payment website
(4) Company buying raw materials online
(5) A student buying a laptop from Dell

35. Which of the following HTML code segment correctly creates a table with two rows and two columns, with the first row containing headers "Name" and "Age"?

(1)
```
<table>
<tr><th>Name</th><th>Age</th></tr>
<tr><td>John</td><td>25</td></tr>
</table>
```

(2)
```
<table>
<thead>Name</thead>
<thead>Age</thead>
<tr>John</tr>
<tr>25</tr>
</table>
```

(3)
```
<table>
<td>Name</td>
<td>Age</td>
<tr>John</tr>
<tr>25</tr>
</table>
```

(4)
```
<table>
<tr><td>Name</td><td>Age</td></tr>
<tr><th>John</th><th>25</th></tr>
</table>
```

(5)
```
<table>
<th><td>Name</td><td>Age</td></th>
<tr><th>John</th><th>25</th></tr>
</table>
```

36. Which of the following CSS selectors has the highest priority?
(1) div p (2) .class1 .class2 (3) #id1 (4) [type="text"] (5) div > p:first-child

See page six

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37. What will be the output of the following Python code? print(type(10 / 2))
(1) <class 'int'> (2)<class 'float'> (3)<class 'complex'>
(4) <class 'str'> (5) <class 'decimal'>

38. What does the len() function return when called on a dictionary?
(1) Number of key-value pairs (2) Number of unique keys
(3) Number of unique values (4) Total memory size of the dictionary
(5) Number of keys plus number of values

39. What is the default data type of the value returned when input () function is used?
(1) Boolean (2) List (3) Float (4) Integer (5)String

40. Which operator is used to check if two values are NOT equal in Python?
(1) <> (2) = = (3) ! (4) ! = (5)not =

41. What is the correct way to open a file and ensure it is properly closed even if an error occurs?
(1) file = open("data.txt", "r") (2) open("data.txt", "r").close()
(3) with open("data.txt", "r") as file: (4) file = open("data.txt", "r"); file.close()
(5) try: file = open(...) finally: file.close()

42. What is the output of print (2 ** 3 ** 2)?
(1) 64 (2) 512 (3) 12 (4) 36 (5) 8

43. What output does the following Python code produce?

```
a = [1, 2, 3]
b = a
b.append(4)
print(a)
```

(1) [1,2,3] (2) [1,2,3,4] (3) None
(4) [4] (5) [1,2,3][4]

44. Which of the following statement/s is are **true**?
A. A program is a passive collection of instructions stored on a disk.
B. A process is an active entity.
C. A single process can have multiple programs running at the same time.
(1) A only (2) B only (3) C only
(4) A and B only (5) A, B and C

45. Which of the following is a green computing practice?
(1) Leaving computers on 24/7 (2) Printing every document
(3) Using energy-efficient hardware (4) Increasing monitor brightness
(5) Disposing of batteries in regular trash

46. Which of the following is an example of an emerging trend in ICT?
(1) Analog Telephones (2) Blockchain Technology
(3) Manual Filing Systems (4) Floppy Disks
(5) World wide web

See page seven

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47. What happens when a user clicks a reset button in a form?
    (1) All form fields are cleared or restored to their original default values.
    (2) The browser reloads the entire webpage.
    (3) The user is redirected back to the previous page in their history.
    (4) The computer's cache is cleared for security purposes.
    (5) The form data is submitted to the URL specified in the action attribute

48. Which statement about the 'POST' method is TRUE?
    A. It has no limit on the amount of data that can be sent.
    B. It displays the form data in the address bar of the browser.
    C. It is less secure than the GET method.
    (1) A only (2) B only (3) C only
    (4) A and B only (5) A, B and C

49. When taking a user's age as input, which is the most robust way to store it for future calculations?
    (1) age = str(input()) (2) age = input() (3)age = int(input())
    (4) age = float(input()) (5) age = bool(input())

50. The "Internet of Things" refers to
    (1) A single global network that connects all personal computers.
    (2) The network of physical objects and software to connect and exchange data.
    (3) A virtual reality headset used for gaming.
    (4) The security protocols used to protect online banking.
    (5) The main server that hosts all websites on the internet.

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DEPARTMENT OF EDUCATION - CENTRAL PROVINCE

G.C.E.(A/L) Practice Test- 2026

Information & Communication technology	20	E	II	Grade 13	3 Hours

Important:

Additional Reading Time – 10 minutes

- *This question paper consists of five pages.*
- *This question paper comprises of two parts, **Part A** and **Part B**. The time allotted for **both parts** is **three hours**.*

Part A (Structured Essay)
(pages 1-4)

- *Answer **all** the questions on **this paper itself.** Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and that extensive answers are not expected.*

Part B (Essay)
(pages 5-7)

- *This part contains **six** questions, of which, **four** are to be answered. Use the paper supplied for this purpose.*
- *At the end of the time allotted for this paper, tie **the two parts together** so that **Part A** is **on top** of **Part B** before handing them over to the Supervisor.*
- *You are permitted to remove **only Part B** of this question paper from the examination hall.*

Part A - Structured Essay

*Answer **all four questions** on this paper itself.*

1. Hasitha has created a database for his company using MySQL.

(i) Using figure 1.1 given below write the SQL statement used to create the table **employee.**

```
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| EmployeeId | char(4)     | NO   | PRI | NULL    |       |
| FullName   | varchar(50) | YES  |     | NULL    |       |
| DOB        | date        | YES  |     | NULL    |       |
| salary     | int         | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.02 sec)
```

Figure 1.1

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(ii) Write down the SQL statement required to insert the following data of EmployeeId E001 to the **employee** table.
E001, Saman Perera, 1978-02-12, 20000

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(iii) Hasitha has used HTML and PHP to create his company web site. Figure 1.2 displays code segment is related to viewing full name and salary of all employees in the company. Use the list below to complete the missing parts of the code. **Write the number of each replacement you have selected in the given box in figure 1.2.**

```
<html><body>

<?php
$conn = new mysqli( [ ] 'hasitha', 'EWQ897#0', 'powerteam');
if ($conn->connect_error) {
  die("Connection failed: ". $conn->connect_error);
}
$sql = [ ] ;

$result = $conn->query($sql);
if ($result->num_rows > 0) {
  echo "<table><tr><th> Full Name</th><th>salary</th></tr>";
  // output data of each row
  while($row = $result->[ ]) {

echo "<tr><td>".$row["FullName"]."</td><td>".$row["salary"].</td>
</tr>";
  }
  [ ] "</table>";
} else {echo "0 results";
}
$conn->[ ];
?> </body></html>
```

Figure 1.2

List: 1. close()	2. 	3.echo	4.'admin'	5.'localhost'
6."SELECT FullName, salary FROM employee"				7. fetch_assoc()
8."SELECT FullName, salary FROM powerteam"				

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2. Mayura needs to design a program to greet her class mates when entering the class room.

(i) Draw a flow chart to greet someone entering the class room based on the given time periods.

Good morning should be displayed from 0.00 a.m to 11.59 a.m.

Good afternoon should be displayed from 12.00 p,m to 3.00 p,m.

Good evening should be displayed from 3.01 p,m to 7.00 p.m

(ii) Write the python code for the algorithm you have written in (i).

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See page four

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3. Memory management is a fundamental role of the operating system.

(i) Name two techniques used for effective memory management in computers.

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(ii) Briefly explain the difference between process control block (PCB) and process state transition diagram.

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(iii) Draw a process state transition diagram showing the following four states only: Ready, Running, Waiting, Terminated. Label all possible transitions between these states.

4. (i) Compare e-Commerce and e-Business with suitable examples.

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(ii) A small clothing boutique in Kandy is considering moving its business online. Give two advantages and two challenges the boutique might face when adopting e-Commerce.

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(iii) Suggest two security measures the boutique should implement to protect customer data and prevent online fraud.

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G.C.E.(A/L) Practice Test- 2026

Information & Communication technology	20	E	II

Part B

- *Answer any **four** questions only*

5. (a) Simplify the following Boolean expression using Boolean algebra. Show each step clearly.

$$F = A'B'C' + A'B'C + A'BC' + A'BC + AB'C'$$

(b) A chemical plant has three safety sensors: A high temperature sensor (P), a high-pressure sensor (Q) and a gas leak detect sensor(R). All the sensors state becomes 1 when they detect the particular properties. The alarm system must activate (F = 1) when any two of the three sensors are active.

(i) Draw the truth table for the output $F(P, Q, R)$.

(ii) Write the Boolean expression in sum-of-products (SOP) form directly from the truth table.

(iii)Simplify the expression you obtained in (ii) using a Karnaugh map.

(iv)Draw the logic circuit for the simplified expression using AND, OR, NOT gates only.

6. (a) Explain the difference between circuit switching and packet switching giving one advantage and one disadvantage of each.

(b) A company has 4 departments: Admin (50 hosts), Sales (120 hosts), Research & Development (30 hosts), Human Relations (20 hosts). IP 192.168.1.0/24 should be used to accommodate all departments with minimal waste.

(i) Show the subnet mask, network address and broadcast address for each department.

(ii) Explain what is a private IP address.

(c) Explain three key features of TCP.

(d) A school has 3 buildings, each with 10 computers. Design a **LAN** using a star topology. Identify necessary devices and cabling.

7. Read the following scenario and answer the given questions.

A public library wants to design a database to manage its daily operations. Each book in the library has a unique ISBN[ISBN], a title[title], a publication year[pubyear]. A book may be written by one or more authors. For each author, the library stores a unique author ID [auID] and name[name]. Each book is published by exactly one publisher. Publishers are identified by a unique publisher ID

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[pubID] and have a name[pubName] and address[address]. The library may have multiple copies of the same book. Each copy is identified by a copy number[copynum] together with the book's ISBN. The status[status] of each copy is also recorded.

Each library member has a unique member ID[memID], full name[fullname], date of birth[DOB], phone number[pn], and membership date[memDate]. A member can borrow many books, but a specific physical copy of a book can be borrowed by only one member at a time. The library keeps track of loans. Each loan is identified by a loan ID [loanID]. For each loan, the system records the loan date[loanDate], due date[dueDate], and actual return date[actRDate]. A loan is associated with exactly one member and exactly one book copy.

(i) Draw an ER diagram for the above scenario. It should use standard symbols and rules. Mention if you make any assumptions. Use only the terms given within square brackets for the attributes.

8. TravelEasy is a popular website where users can book flights, hotels, and rental cars. To improve customer experience, the company uses several software agents:
   - A search agent that scans airlines and hotel websites to find the best prices.
   - A negotiation agent that can bargain with hotel booking platforms on behalf of the user.
   - A recommendation agent that suggests destinations based on the user's past bookings and browsing history.

   (i) Define a software agent in the context of this web site.

   (ii) Identify three characteristics of a search agent.

   (iii) Briefly explain how above characteristics mentioned in (ii) is demonstrated using software agents in the given scenario.

   (iv) Suggest one security or trust issue that might arise with the negotiation agent.

9. A local government body (NUDA) plans to develop a "Building Permit Management System" to replace its current manual paper-based process. The system will allow citizens to apply for building permits online, track application status, and receive approvals digitally. NUDA staff will use the system to verify documents, conduct site inspections, and issue permits. NUDA staff use tablets to record data. The system must integrate with the existing e-Citizen portal and the National Identity Card (NIC) verification service. You are appointed as a system analyst. The project will follow SSADM.

   (i) List three functional requirements for this system.

   (ii) List three non-functional requirements for this system.

   (iii) Name three requirement gathering techniques that can be used here.

   (iv) Mention how each could be applied to this scenario.

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(v)A developer argues: *"If we satisfy all functional requirements, the system will be successful. Non-functional requirements are optional."* Critically evaluate this statement using the NUDA system as an example.

10. A tea estate in Nuwara Eliya wants to implement an IoT-based smart agriculture system to monitor soil moisture, temperature, humidity, and rainfall. The system should send alerts to the planter's mobile phone when conditions require action (e.g., irrigation needed).

(i) Draw a labelled block diagram showing the main components of this IoT system and how they interact.

(ii) Explain the data flow from the sensors to the planter's mobile phone, including the role of a cloud platform and communication protocols.

(iii) Give two challenges the estate owners would face when implementing this system in Nuwara Eliya.

(iii)For the smart agriculture system, write a Python function named check_irrigation(). It should take soil_moisture (integer percentage), temperature (float in °C), and rainfall_today (float in mm) as inputs. It should return "IRRIGATE" if either soil_moisture is below 40% and temperature is above 28°C, or rainfall_today is less than 5 mm and soil_moisture is below 50%.it should otherwise return "NO_IRRIGATION".

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