CUET (UG) Exam Paper 2025

National Testing Agency

COMPUTER SCIENCE

(Solved)

[This includes Questions pertaining to Domain Specific Subject only]

Time Allowed: 60 Mins. **Maximum Marks: 250**

General Instructions :

(i) *This Test contains 50 questions.*
(ii) *Five (5) marks will be given for each correct answer.*
(iii) *One (1) mark will be deducted for each incorrect answer.*
(iv) *If more than one option is chosen, then it will be considered as an incorrect answer.*
(v) *Unanswered questions will be given no mark.*

Section–A
Computer Science/Informatics Practices

1. Given Table - 'Employee'
Attributes - Employee ID, Name, Salary
Identify the correct query for performing the following operations:
Increasing the salary by 40% of all employees.

(1) UPDATE EMPLOYEE SET SALARY = SALARY*0.40;
(2) MODIFY EMPLOYEE SET SALARY = SALARY*0.40;
(3) UPDATE EMPLOYEE SET SALARY = SALARY*1.40;
(4) MODIFY EMPLOYEE SET SALARY = SALARY*1.40;

Ans. Option (3) is correct.

Explanation: A 40% increase means you're adding 40% of the current salary to itself:
New Salary=Old Salary+(40% of Old Salary)=Old Salary×1.40

2. Which network topology required a central controller or hub?

(1) Star Topology **(2)** Bus Topology
(3) Tree Topology **(4)** Mesh Topology

Ans. Option (1) is correct.

Explanation: In a star topology, all devices (nodes) are connected to a central controller (hub or switch).
The central hub manages and controls all communication between devices. If the central hub fails, the whole network is affected. This topology definitely requires a central controller or hub.

3. Identify a network where a client can also act as a server if need arises:

(1) Peer-to-Peer Network
(2) Client-Server
(3) Wide Area Network
(4) Personal Area Network

Ans. Option (1) is correct.

Explanation: In a peer-to-peer network, all computers (peers) are equal. There is no dedicated server. Each device can function both as a client and a server, depending on the need.
For example, one computer can share a file (acting as server) while downloading a file from another (acting as client).

4. Table: 'STUDENT'

Roll number	Name	Course
1	Ajay	Science
2	Ankita	Commerce
3	Anmol	Science
4	Bharti	Science
5	Karan	Commerce
6	Mohit	Arts

Consider the given query:

SELECT COURSE, COUNT (*) FROM STUDENT GROUP BY COURSE HAVING COURSE = "Science";

What is the use of the 'HAVING' clause in the above query?

(1) To filter out the column groups.
(2) To filter out the summary groups.
(3) To filter and sort the data.
(4) To filter out the row and column values.

Ans. Option (2) is correct.

Explanation: The SQL query:
- Groups the records by the COURSE column.
- Then, counts the number of students in each course group.
- Finally, the HAVING clause filters the grouped results, keeping only the group where COURSE = "Science".

Key Difference:
- WHERE is used to filter rows before grouping.
- HAVING is used to filter groups after aggregation (i.e., after GROUP BY).

In this case:
We grouped the data by COURSE.
Then HAVING COURSE = "Science" filtered the group where course is "Science".

5. Given a table: 'Student' having attributes [Admission_number, Roll_no, Name, Marks]

The Primary key Admission_number of this table is selected from the set of:

(1) Foreign Keys **(2)** Candidate Keys
(3) Unique Keys **(4)** Alternate Keys

Ans. Option (2) is correct.

Explanation: A candidate key is an attribute (or a set of attributes) that can uniquely identify a row in a table.
A table can have multiple candidate keys. One of these candidate keys is chosen as the primary key.
Primary Key is the main candidate key selected to uniquely identify each record in a table.
In this case, Admission_number is chosen from candidate keys to be the primary key.

6. Identify the syntactically correct SQL query in order to insert a record in the table 'STUDENT' having attributes as admission_no, name, marks.

(1) INSERT INTO STUDENT(201,"RANBIR", 25);
(2) INSERT INTO STUDENT VALUES(201,"RANBIR", 25);
(3) INSERT INTO STUDENT(admission_no, name, marks)(201,"RANBIR", 25);
(4) INSERT INTO STUDENT VALUE(201,"RANBIR", 25);

Ans. Option (2) is correct.

Explanation: Let's break down the correct SQL syntax for inserting data:
INSERT INTO table_name [(column1, column2, ...)] VALUES (value1, value2, ...);
In this case:
- Table name: STUDENT
- Columns (optional if values are in correct order): admission_no, name, marks
- Values: 201, "RANBIR", 25

7. Which concept of the relation is shown by the following query?

SELECT EMPLOYEE.EMPID, EMPLOYEE.NAME, ORDER.ORDERID, ORDER.ORDERDATE
FROM EMPLOYEE, ORDER;

(1) EQUI-JOIN
(2) NATURAL JOIN
(3) OUTER JOIN
(4) CARTESIAN PRODUCT

Ans. Option (4) is correct.

Explanation: This query:
- Selects columns from two tables: EMPLOYEE and ORDER.
- Joins them without any WHERE clause or JOIN condition.

What happens in such a case?
- The query performs a Cartesian Product (also called cross join).
- Every row from EMPLOYEE is paired with every row from ORDER.
- If EMPLOYEE has m rows and ORDER has n rows, the result will have m × n rows.

8. The first computer network was:

(1) NSFNet **(2)** FirstNet
(3) ARPANet **(4)** Internet

Ans. Option (3) is correct.

Explanation: ARPANet (Advanced Research Projects Agency Network) was the first operational computer network and the precursor to the modern Internet. It was developed in late 1960s by the U.S. Department of Defense's ARPA (now DARPA).

9. A table consist of 10 rows and 5 columns. What is the cardinality and degree of the table if 4 rows are deleted and 3 columns are added?

(1) Cardinality = 8 and Degree = 6
(2) Cardinality = 6 and Degree = 8
(3) Cardinality = 7 and Degree = 1
(4) Cardinality = 1 and Degree = 7

Ans. Option (2) is correct.

Explanation: In database terminology:
- Cardinality = Number of rows (records) in a table
- Degree = Number of columns (attributes) in a table

Initial Table:
- Rows = 10
- Columns = 5

Changes:
- 4 rows are deleted → 10 - 4 = 6 rows
- 3 columns are added → 5 + 3 = 8 columns

Final Result:
- Cardinality = 6
- Degree = 8

10. Given table 'st_marks':

roll number	name	marks
1	Shagun	85
2	Sukhi	63
3	Zoya	86
4	Irfan	NULL
5	Maya	52

Find the output:

SELECT AVG(marks) FROM st_marks:

(1) 57.0 **(2)** 71.0
(3) 57.2 **(4)** 71.5

Ans. Option (4) is correct.

Explanation: SELECT AVG(marks) FROM st_marks;
The AVG() function ignores NULL values.
Valid Marks:
85, 63, 86, 52
→ Total = 85 + 63 + 86 + 52 = 286
→ Number of valid values = 4
Average = Total / Count = 286 / 4 = 71.5

11. Which of the following holds **TRUE** about relations in a relation database management system?

(A) Ordering of rows is immaterial.
(B) No two rows are identical.
(C) Ordering of columns is immaterial.
(D) No two columns are identical.
(1) (A), (B) and (C) only
(2) (A), (B) and (D) only
(3) (B), (C) and (D) only
(4) (A), (B), (C) and (D)

Ans. Option (4) is correct.

Explanation: For option (A) Ordering of rows is immaterial.
- In relational databases, tuples (rows) do not have any inherent order.
- The relation is treated as a set of rows.

For option (B) No two rows are identical.
- In the relational model, each row is unique (usually ensured by a primary key or unique constraint).
- Duplicate rows are not allowed.

For option (C) Ordering of columns is technically immaterial.
- Technically, in the theory of relations (mathematical model), the order of columns is immaterial.
- But in practical RDBMS implementations, column order matters (for queries, storage, etc.).
- Thus, this statement is always strictly true in practice.

For option (D) No two columns are identical.
- Each column in a relation must have a unique name.
- No two columns can have the same name.

12. Identify the type of topology that has the benefits of short cable length, simple wiring layout and easy to extend.

(1) Star Topology **(2)** Tree Topology
(3) Bus Topology **(4)** Mesh Topology

Ans. Option (3) is correct.

Explanation: Bus Topology uses a single central cable (the bus) to which all computers and devices are connected.
It is known for:
- Short cable length (since all devices share the same backbone).
- Simple wiring layout (linear structure).
- Easy to extend (just attach more devices to the bus).

13. Identify the correct statement in order to delete all the rows of a table 'EMPLOYEE' without deleting the structure:

(1) DELETE FROM EMPLOYEE;
(2) DELETE TABLE EMPLOYEE;
(3) DROP FROM EMPLOYEE;
(4) DROP TABLE EMPLOYEE;

Ans. Option (1) is correct.

Explanation: The DELETE FROM EMPLOYEE; statement removes all rows (records) from the table but keeps the table structure intact, so you can insert new data later.
It can also have a WHERE clause to delete specific rows, but without it, it deletes all rows.

14. If a database contains duplicate data in multiple data files, this scenario leads to ..... .

(1) Data Integrity **(2)** Data Insecurity
(3) Data Inconsistency **(4)** Data Redundancy

Ans. Option (4) is correct.

Explanation: When a database contains duplicate data in multiple data files, it results in Data Redundancy.
Data Redundancy means storing the same piece of data in more than one place, which can waste storage and lead to further issues like Data Inconsistency.

15. Match **List-I** with **List-II**.

List-I (SQL Query)	List-II (Result)
(A) SELECT DAY ("2010-09-08");	(I) 4
(B) SELECT MONTH("2015-09-08");	(II) 8
(C) SELECT MOD(MONTH("2020-09-03"), 4);	(III) 9
(D) SELECT POW(DAY("2023-02-02"), 2);	(IV) 1

Choose the **correct** answer from the options given below:

(1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(2) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
(3) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (1) is correct.

Explanation: **For option (1)** SELECT DAY('2010-09-08');
DAY() function returns the day part of the date
→ 08
So, result = 8 → Matches with (II).
For option (2) SELECT MONTH('2015-09-08');
MONTH() function returns the month number
→ 09
So, result = 9 → Matches with (III).
For option (3) SELECT
MOD(MONTH('2020-09-03'), 4);

MONTH('2020-09-03') → 9 (September)
MOD(9, 4) → Remainder when 9 is divided by 4 = 1
So, result = 1 → Matches with (IV).
For option (4) SELECT POW(DAY('2023-02-02'), 2);
DAY('2023-02-02') → 2 (the day)
POW(2, 2) → $2^2 = 4$
So, result = 4 → Matches with (I).

Section–B1
Computer Science

16. Identify the concept being associated with given characteristics:

(A) Data stored in terms of bytes (0s and 1s)
(B) Not human readable
(C) No translation of data required
(D) Faster in execution

(1) Text files **(2)** CSV files
(3) Binary Files **(4)** Data number files

Ans. Option (3) is correct.

Explanation: The characteristics describe Binary Files because:
a) Data stored in terms of bytes (0s and 1s) → Binary files store data in its raw binary form.
b) Not human readable → Binary files are not meant to be read by humans directly.
c) No translation of data required → Data is stored and processed as-is, without conversion.
d) Faster in execution → Since there is no need for encoding/decoding, binary files are generally faster to read/write.

17. Identify the incorrect built in exception from the following:

(1) ValuesError **(2)** EOFError
(3) KeyboardInterrupt **(4)** IndentationError

Ans. Option (1) is correct.

Explanation: In Python, the correct built-in exception is ValueError, not ValuesError.

18. Identify the correct program to open the text file in write mode only.

Note:(If the file already exists, all the contents will be overwritten. If the file doesn't exist, then a new file will be created.)

(1) myObject=open("myfile.txt", "a+")
(2) myObject=open("myfile.txt", "w")
(3) myObject=open("myfile.txt", "wb")
(4) myObject=open("myfile.txt", "w+")

Ans. Option (2) is correct.

Explanation: open("myfile.txt", "w")
- "w" means write mode.
- Opens the file for writing, overwriting existing content.
- If the file does not exist, it creates a new file.
- This mode is for writing text only.

That exactly matches what the question asks.

19. In the following list, bubble sort technique has been applied to sort a list of elements.

numList2 = [8, 7, 6, 5, 4]

Arrange the list after each pass in order:

(A) [7, 6, 5, 4, 8] **(B)** [5, 4, 6, 7, 8]
(C) [8, 7, 6, 5, 4] **(D)** [6, 5, 4, 7, 8]

Choose the **correct** answer from the options given below:

(1) (C), (B), (A), (D) **(2)** (C), (A), (D), (B)
(3) (C), (A), (B), (D) **(4)** (C), (B), (D), (A)

Ans. Option (2) is correct.

Explanation: Let's go through the problem step by step.
We have:
numList2 = [8, 7, 6, 5, 4]
We are applying bubble sort to sort it in ascending order.
Let's see what the list looks like after each pass.
Initial list:
[8, 7, 6, 5, 4] → matches option (C)
Pass 1:
Compare adjacent elements:
8 > 7 → swap → [7, 8, 6, 5, 4]
8 > 6 → swap → [7, 6, 8, 5, 4]
8 > 5 → swap → [7, 6, 5, 8, 4]
8 > 4 → swap → [7, 6, 5, 4, 8]
After pass 1: [7, 6, 5, 4, 8] → matches option (A)
Pass 2:
7 > 6 → swap → [6, 7, 5, 4, 8]
7 > 5 → swap → [6, 5, 7, 4, 8]
7 > 4 → swap → [6, 5, 4, 7, 8]
After pass 2: [6, 5, 4, 7, 8] → matches option (D)
Pass 3:
6 > 5 → swap → [5, 6, 4, 7, 8]
6 > 4 → swap → [5, 4, 6, 7, 8]
After pass 3: [5, 4, 6, 7, 8] → matches option (B)
Pass 4:
5 > 4 → swap → [4, 5, 6, 7, 8]
Now the list is sorted.
So, order after each pass:
Initial: (C)
Pass 1: (A)
Pass 2: (D)
Pass 3: (B)

20. ..... indicate the degree of diversity in a data set or difference within the group.

(1) Mean
(2) Mode
(3) Measures of Dispersion
(4) Median

Ans. Option (3) is correct.

Explanation: Mean, median, and mode are measures of central tendency; they describe the central or typical value in a data set.
Measures of dispersion (such as variance, standard deviation, and range) describe how much the data points differ from each other and from the mean — i.e., the degree of diversity or spread in the data.

21. Identify the ***incorrect*** statements with respect to Wired Transmission Media:

(A) There is a physical link made of wire/cable through which data in terms of signals are propagated between the nodes.

(B) An example of wired transmission media is Radio waves.

(C) It is also known as guided transmission.

(D) Data travels in air in terms of electromagnetic waves using an antenna.

Choose the **correct** answer from the options given below:

(1) (A) and (C) only **(2)** (A), (B) and (D) only

(3) (A), (B) and (C) only **(4)** (B) and (D) only

Ans. Option (4) is correct.

Explanation: (A) There is a physical link made of wire/cable through which data in terms of signals are propagated between the nodes.
This is correct for wired transmission media.
(B) An example of wired transmission media is Radio waves.
Incorrect—radio waves are wireless transmission media.
(C) It is also known as guided transmission.
Correct—wired transmission media are also called guided media, because the signal is guided along a physical path.
(D) Data travels in air in terms of electromagnetic waves using an antenna.
Incorrect—this describes wireless communication, not wired.
So, the incorrect statements are:
(B)(D)

22. ..... means same data are duplicated in different places (files).

(1) Data Redundancy

(2) Data Inconsistency

(3) Data Isolation

(4) Controlled Data Sharing

Ans. Option (1) is correct.

Explanation:

- Data Redundancy occurs when the same piece of data is stored in multiple places unnecessarily, leading to duplication.
- Data Inconsistency is a result of redundancy — when the duplicated data does not match in different locations.
- Data Isolation refers to difficulty in accessing and integrating data stored in different places.
- Controlled Data Sharing is about managing access, not duplication.

23. Apply bubble sort technique to sort a list of elements:

numList2 = [8, 7, 6, 5, 4]. Show the positions of elements in the list after pass 1.

(1)	7	6	4	5	8
(2)	4	5	6	7	8
(3)	7	6	5	4	8
(4)	7	6	5	8	4

Ans. Option (3) is correct.

Explanation: Pass 1:
Compare 8 and 7 → 8 > 7 → swap → [7, 8, 6, 5, 4]
Compare 8 and 6 → 8 > 6 → swap → [7, 6, 8, 5, 4]
Compare 8 and 5 → 8 > 5 → swap → [7, 6, 5, 8, 4]
Compare 8 and 4 → 8 > 4 → swap → [7, 6, 5, 4, 8]
After the first pass, the largest element (8) has "bubbled up" to the last position.

24. Which search technique the given steps are associated with?

Step 1: SET first = 0, last = $n - 1$

Step 2: Calculate mid = (first + last) // 2

(1) Searching by Hashing

(2) Collision

(3) Binary Search

(4) Linear Search

Ans. Option (3) is correct.

Explanation: Let's look at the question:
Step 1: SET first = 0, last = $n - 1$
Step 2: Calculate mid = (first + last) // 2.
These steps describe initializing the start and end of a sorted list and repeatedly calculating the middle index.
This is characteristic of Binary Search.

25. Match List-I with List-II

List-I	List-II
(A) SUBSTR()	(I) Returns month name of a date.
(B) MONTHNAME()	(II) Returns cardinality of a table.
(C) MOD()	(III) Extracts a portion of a string.
(D) COUNT(*)	(IV) Returns remainder value.

Choose the **correct** answer from the options given below:

(1) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

(2) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

(3) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

(4) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

Ans. Option (4) is correct.

Explanation: (A) SUBSTR()
This function extracts a substring from a string.
Matches with: (III) Extracts a portion of a string.
(B) MONTHNAME()
This function returns the name of the month for a given date.
Matches with: (I) Returns month name of a date.
(C) MOD()
This function returns the remainder of a division operation.
Matches with: (IV) Returns remainder value.
(D) COUNT(*)
Counts the number of rows in a table → gives the cardinality.

Matches with: (II) Returns cardinality of a table.
So the correct matching is:
(A) - (III)
(B) - (I)
(C) - (IV)
(D) - (II)

26. Find the range from the given data: (Height in cm)

[85, 90, 90, 100, 102, 110, 110, 110, 115]

(1) 110 cm **(2)** 95 cm
(3) 102 cm **(4)** 30 cm

Ans. Option (4) is correct.

Explanation: Given data:
85, 90, 90, 100, 102, 110, 110, 110, 115
Range is calculated as:
Range=Maximum value−Minimum value
Maximum value = 115
Minimum value = 85
115−85=30
So, the range is: 30 cm

27. 'ABC' company is a professional company. The company is planning to set up their new offices in india. As a network advisor, suggest them where they should place the server, after studying the following scenario.

Expected number of computers in each block:

BLOCK	NO. OF COMPUTERS
HUMAN	25
FINANCE	120
CONFERENCE	90
ADMIN	400

(1) HUMAN **(2)** FINANCE
(3) CONFERENCE **(4)** ADMIN

Ans. Option (4) is correct.

Explanation: The server should ideally be placed in the block with the maximum number of computers.
Reason:
This block will generate the most traffic to the server.
Placing the server close to where the maximum usage is will reduce network congestion, improve speed and efficiency, and optimize resource usage.
Observation:
ADMIN block has 400 computers, which is much higher than others.
So, the server should be placed in: ADMIN

28. Identify the term coined for:

In this attack, the hacker taps or listens to a channel of communication by picking all of the network traffic passing through it.

(1) Eavesdropping **(2)** Snooping
(3) Traffic Flooding **(4)** Denial of Service

Ans. Option (1) is correct.

Explanation: The question mentions:
"the hacker taps or listens to a channel of communication by picking all of the network traffic passing through it"
— this describes Eavesdropping, where unauthorized entities gain access to confidential data by monitoring network traffic.

29. Arrange the steps of handing exceptions in order.

(A) The exception object is handed over to the runtime system so that it can find an appropriate code to handle his particular exception.
(B) If the runtime system is not able to find an appropriate exception after searching all the methods in the call stack, then the program execution stops.
(C) The runtime system searches the entire program for a block of cold, called the exception handler that can handle the raised exception.
(D) When and error occurs, Python interpreter creates an object called the exception object.

Choose the correct answer from the options given below:

(1) (A), (B), (C), (D) **(2)** (D), (C), (B), (A)
(3) (D), (B), (A), (C) **(4)** (D), (A), (C), (B)

Ans. Option (4) is correct.

Explanation: Step 1 – (D):
"When an error occurs, Python interpreter creates an object called the exception object."
This is the first step: when an error happens, Python raises (creates) an exception object.
Step 2 – (A):
"The exception object is handed over to the runtime system so that it can find an appropriate code to handle this particular exception."
The interpreter then passes the exception to the runtime system for further handling.
Step 3 – (C):
"The runtime system searches the entire program for a block of code, called the exception handler that can handle the raised exception."
Python now searches through the call stack to locate a matching except block that can handle the raised exception.
Step 4 – (B):
"If the runtime system is not able to find an appropriate exception after searching all the methods in the call stack, then the program execution stops."
If no handler is found, Python will terminate the program and print a traceback message.
Final Answer:
(D), (A), (C), (B) → Option 4

30. Arrange the given data models in a hierarchy from older to newer:

(A) Manual System
(B) Relational Data Model
(C) File System
(D) Database Management System

Choose the correct answer from the options given below:

(1) (A), (C), (D), (B) **(2)** (A), (B), (C), (D)

(3) (A), (B), (D), (C) **(4)** (A), (C), (B), (D)

Ans. Option (1) is correct.

Explanation: (A) Manual System
Oldest form of data management.
Data was stored and processed manually on paper, without computers.
(C) File System
Introduced with early computers.
Data stored in files and managed by operating systems, but lacked structure, integrity, and consistency checks.
(D) Database Management System (DBMS)
Came after file systems to address their limitations.
Provided better data integrity, reduced redundancy, and centralized control.
(B) Relational Data Model
Introduced by E.F. Codd in 1970.
It's a type of DBMS model that uses tables (relations) and became the foundation of modern databases like MySQL, Oracle, etc.
Final Order:
Manual System → File System → DBMS → Relational Data Model

31. Assume that the numList has seven elements [8, –4, 7, 17, 0, 2, 19]

If the list is not sorted and used as it is, then which among the following is the best suitable search technique to search any element?

(1) Binary Search
(2) Searching by Hashing
(3) Linear Search
(4) Bubble Search

Ans. Option (3) is correct.

Explanation: Given list:
numList = [8, -4, 7, 17, 0, 2, 19]
This list is unsorted.
Why Linear Search is best:
- Linear Search works by checking each element one by one from start to end.
- It does not require the list to be sorted.
- Perfect for small or unsorted datasets like the one in the question.

Why other options are not suitable:
- Binary Search – Requires the list to be sorted in ascending or descending order. Not suitable here.
- Searching by Hashing – Efficient, but needs extra space and structure like hash tables. The question implies using the list as-is, so hashing is not suitable directly.
- Bubble Search – This is a trick option. Bubble Sort exists, not "Bubble Search". So this is invalid.

32. Identify the incorrect example related to application of queues.

(1) Sending print commands from multiple files from the same computer or from different computers using a shared printer.

(2) A web-server hosting a web-site to declare results(s). To serve thousands of user requests, a Queue would be the most appropriate data structure to use.

(3) To maintain browser history, once a tab is closed and if you press ctrl + shift+ T, the most recently closed URL is opened first, As the number of URL Stored is fixed. so when this list of URLs becoming large, URLs from the end of the list (i.e. which were least visited) gets deleted.

(4) In a multitasking operating system, jobs are lined up and then given access to the processor according to some order.

Ans. Option (3) is correct.

Explanation: Why Option 3 is incorrect):
- Browser history or recently closed tabs follow a Last-In-First-Out (LIFO) order — which is the characteristic of a stack, not a queue.
- When you reopen a closed tab (e.g., using Ctrl + Shift + T), the most recently closed tab is opened first, which clearly shows stack behavior.

33. Identify the type of expression where operators are placed after the corresponding operands like *xy* * *z* + ; 345 + *; *x*

y + *z* 5 */

(1) Infix Expression
(2) Polish Expression
(3) Reverse Polish Expression
(4) Prefix Expression

Ans. Option (3) is correct.

Explanation: In a Reverse Polish Expression (also called Postfix Notation):
- Operators are placed after the operands
- There are no parentheses needed to enforce operator precedence
- Expressions are evaluated left to right

Examples from the question:
- *x y* * *z* + → means (*x* * *y*) + *z*
- 3 4 5 + * → means 3 * (4 + 5)
- *x y* + *z* 5 * / → means (*x* + *y*) / (*z* * 5)

34. When we deal with personal information, banking credentials and passwords on websites, we need to communicate data more securely over the network using HTTPS. HTTPS encrypts the data before transmission. At the receiver end, it decrypts to recover the original data. The HTTPS based website require ..... .

(1) Credential Certificate
(2) SSL Digital Certificate
(3) SOL Digital Certificate
(4) Secure Certificate

Ans. Option (2) is correct.

Explanation: HTTPS (HyperText Transfer Protocol Secure) ensures secure communication over the internet.

It uses SSL/TLS protocols to encrypt the data before transmission and decrypt it at the receiver's end.
To establish a trusted and secure connection, HTTPS websites must have an SSL (Secure Sockets Layer) Digital Certificate issued by a Certificate Authority (CA).
SSL is now commonly replaced with TLS (Transport Layer Security) but still widely referred to as SSL.

35. Sequence to check if a queue is empty and handle underflow in a programming context:

(A) Attempt to dequeue an element.
(B) Check if the queue is empty.
(C) Return an error message if empty.
(D) Proceed with dequeue if not empty.

Choose the correct answer from the options given below:

(1) (A), (B), (C), (D) **(2)** (D), (B), (C), (A)
(3) (A), (C), (B), (D) **(4)** (D), (C), (B), (A)

Ans. The Correct Option is [Bonus]

Explanation: To check if a queue is empty and handle underflow properly:
(B) Check if the queue is empty
(C) Return an error message if empty
(D) Proceed with dequeue if not empty
(A) Attempt to dequeue an element
So, the correct sequence is: (B) → (C) → (D) → (A)
Note: The correct option has not been given by the NTA in the question.

36. Match **List-I** and **List-II**

Considering a sorted list comprising 15 elements:

numList = [2, 3, 5, 7 ,10, 11, 12, 17, 19, 23, 29, 31, 37, 41, 43]

List-I	List-II
(A) Search for value 7 using linear search	(I) Comparison = 1
(B) Search for value 17 using binary search	(II) Comparison = 8
(C) Search for value 17 using linear search	(III) Comparison = 2
(D) Search for value 7 using binary search	(IV) Comparison = 4

Choose the **correct** answer from the options given below:

(1) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
(2) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(3) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(4) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Ans. Option (1) is correct.

Explanation: We are given a sorted list of 15 elements:
numList = [2, 3, 5, 7, 10, 11, 12, 17, 19, 23, 29, 31, 37, 41, 43]
We need to match different search operations with the number of comparisons.

Step-by-step Matching:
(A) Search for value 7 using linear search
Linear search checks elements from left to right.
Position of 7 is at index 3, so 4 comparisons are needed.
Matches with: (IV) Comparison = 4
(B) Search for value 17 using binary search
Binary search splits the list:
Step 1: mid = index 7 → numList[7] = 17 (found!)
Only 1 comparison is needed.
Matches with: (I) Comparison = 1
(C) Search for value 17 using linear search
Position of 17 is at index 7, so linear search will make 8 comparisons.
Matches with: (II) Comparison = 8
(D) Search for value 7 using binary search
Binary search steps:
Step 1: mid = 7 → value = 17 → search left
Step 2: mid = 3 → value = 7 → found
2 comparisons
Matches with: (III) Comparison = 2

37. Giga bits per second = ...

(1) 2^{10} bits per second **(2)** 2^{20} bits per second
(3) 2^{30} bits per second **(4)** 2^{40} bits per second

Ans. Option (3) are correct.

Explanation: In computing, prefixes like Kilo, Mega, Giga, Tera are often interpreted in binary, especially when referring to memory or data capacity.
1 Gigabit per second (Gbps) = $2^{3'}$ bits per second (in binary system, which is commonly used in computing)

38. A/An ..... is an exceptionally large or small value, in comparison to other values of the data.

(1) Mode **(2)** Mean value
(3) Extreme **(4)** Outlier

Ans. Option (4) is correct.

Explanation: An outlier is a data point that is significantly different from other observations in a dataset.
- It can be exceptionally high or low.
- Outliers can skew statistical analyses and are often investigated for data errors or rare phenomena.

39. Find the output of the code:

```
answer = []
output = ' '
answer. append ('F')
answer. append ('I')
answer.append ('L')
ch = answer.pop ()
output = output + ch
ch = answer.pop()
output = output + ch
ch=answer.pop()
```

output = ch

print("Result=", output)

(1) Result = FIL **(2)** Result = LIF

(3) Result = F **(4)** Result = L

Ans. Option (3) is correct.

Explanation: Only the last assignment to output is:
output = ch # ch = 'F'
So, the final printed result is:
print("Result=", output)
# Result = F

40. Fill in the blanks with suitable combinations:

(Note: While browsing the web, we move from one web page to another by accessing links between them. In order to go back to the last visited web page, we may use the back button on the browser.)

Let us say we accessed a web page P1 from where we moved to web page P2 followed by browsing of web page P3.

Currently, we are on web page ..... and want to revisit web page P1, we may go to a previously visited web page by using the ..... button of the browser. On clicking the ..... button ..... we are taken from web page P3 to web page P2, another click on back shows web page ..... in This case, the history of browsed pages is maintained as stack.

(1) P1; Next; Next; twice; P3.

(2) P3; Back; Next; once; P1.

(3) P3; Next; Back; once; P2.

(4) P3; Back; Back; once; P1.

Ans. Option (4) is correct.

Explanation: Let's walk through the browsing steps:
Browsing sequence:
- First visited: P1
- Then moved to: P2
- Then moved to: P3

So now, the current page is: P3
Now filling the blanks:
- Currently, we are on web page P3
- and want to revisit web page P1.
- We may go to a previously visited web page by using the Back button.
- (Going backward in history.)
- On clicking the Back button once,

from P3 → P2
- Another click on back shows web page P1

Stack Behavior:
Browsing history behaves like a stack (LIFO):
- Last page visited (P3) is popped first when back is clicked,
- then P2 is popped to reach P1.

41. Identify the incorrect method of Malware Identification used by Antivirus:

(1) Sandbox detection

(2) Real-Time protection

(3) Signature-based detection

(4) Spam

Ans. Option (4) is correct.

Explanation: Antivirus software uses several recognized techniques for malware identification, including:
- Sandbox detection – Runs suspicious files in a controlled environment to observe behavior before allowing them to execute fully.
- Real-time protection – Constantly monitors system activities to detect malware as soon as it tries to infect.
- Signature-based detection – Compares files to a database of known malware patterns (signatures).

Why Option 4 is Incorrect:
- Spam refers to unwanted or unsolicited emails, not a method used to identify malware directly.
- Spam filtering is part of email security, not malware detection in antivirus software.

42. A deque contains 'a', 'p', 'l', 'm' and 'n'. Elements received after deletion are 'a', 'n', 'm', 'p' and 'l' ..... the sequence of deletion operations performed on the deque.

(1) DeletionFront DeletionRear
Deletion Rear
DeletionFront
DeletionRear

(2) DeletionRear DeletionFront
DeletionRear
DeletionFront
DeletionRear

(3) DeletionFront DeletionRear
DeletionRear
DeletionRear
DeltionFront

(4) DeletionFront DeletionFront
DeletionRear
DeletionFront
DeletionFront

Ans. Option (1) is correct.

Explanation: Let's test each option step-by-step.
Option 1:
Sequence:
DeletionFront, DeletionRear
DeletionRear
DeletionFront
DeletionRear
Initial deque: ['a', 'p', 'l', 'm', 'n']
DeletionFront → remove 'a' → ['p', 'l', 'm', 'n']
DeletionRear → remove 'n' → ['p', 'l', 'm']
DeletionRear → remove 'm' → ['p', 'l']
DeletionFront → remove 'p' → ['l']
DeletionRear → remove 'l' → []
Resulting deletion sequence: ['a', 'n', 'm', 'p', 'l'] (Matches expected)
Option 2:
Sequence:
DeletionRear, DeletionFront

DeletionRear
DeletionFront
DeletionRear
Initial deque: ['a', 'p', 'l', 'm', 'n']
DeletionRear → remove 'n' → ['a', 'p', 'l', 'm'] (expected first element is 'a')
Doesn't match the required sequence.
Option 3:
Sequence:
DeletionFront, DeletionRear
DeletionRear
DeletionRear
DeletionFront
1.DeletionFront → 'a'
2.DeletionRear → 'n'
3.DeletionRear → 'm'
4.DeletionRear → 'l' (expected 'p')
5.DeletionFront → 'p' (too late)
Mismatch.
Option 4:
Sequence:
DeletionFront, DeletionFront
DeletionRear
DeletionFront
DeletionFront
1.DeletionFront → 'a'
2.DeletionFront → 'p' (expected 'n')
Mismatch.

43. Which network device is used to connect different devices through wires?

(A) Ethernet Hub **(B)** Modem
(C) Switch **(D)** Repeater

Choose the correct answer form the options given below:

(1) (A) and (C) only **(2)** (A) and (B) only
(3) (A), (B), (C) and (D) **(4)** (A), (B) and (C) only

Ans. Option (1) is correct.

Explanation: An Ethernet hub connects multiple computers or network devices using Ethernet cables in a LAN.
Works on the physical layer of the OSI model.
A switch connects multiple devices in a network using Ethernet cables and operates at the data link layer (Layer 2).
It's more intelligent than a hub and forwards data to the correct device.

44. ..... is a communication protocol which establishes a dedicated and direct connection between two communicating devices. This protocol defines how two devices will authenticate each other and establish a direct link between them to exchange data.

(1) File Transfer Protocol (FTP)
(2) HyperText Transfer Protocol (HTTP)
(3) Point to Point Protocol (PPP)
(4) Transmission Control Protocol (TCP)/Internet Protocol (IP)

Ans. Option (3) is correct.

Explanation: Let's evaluate the options:
1. File Transfer Protocol (FTP)
- Used to transfer files between systems.
- Does not inherently establish a dedicated connection for general communication.
- Not correct.

2. HyperText Transfer Protocol (HTTP)
- Used for retrieving web content from a server.
- Stateless, not a dedicated link protocol.
- Not correct.

3. Point-to-Point Protocol (PPP)
Correct:
- Designed to establish a direct and dedicated connection between two nodes.
- Used often in dial-up and direct serial links.
- Provides authentication, encryption, and compression.
- Perfectly matches the question description.

4. Transmission Control Protocol (TCP) / Internet Protocol (IP)
- TCP establishes reliable connections, but IP is connection less.
- TCP/IP is a suite, not specifically for point-to-point links.
- Not as explicitly focused on authentication and dedicated link setup as PPP.
- Not the best fit.

45. Match **List-I** with **List-II**.

List-I	List-II
(A) The topology in which each communicating device is connected with every other device in the network.	(I) Chatting
(B) A device that connects organisation's network with the outside world internet.	(II) Mesh
(C) An online textual and multimedia conversation.	(III) Incognito
(D) Private Browsing	(IV) Gateway

Choose the **correct** answer from the options given below:

(1) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
(2) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)
(3) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (2) is correct.

Explanation: Let's match List-I with List-II:
(A) The topology in which each communicating device is connected with every other device in the network.
This describes a Mesh Topology
So, (A) → (II) Mesh
(B) A device that connects an organisation's network with the outside world Internet.
This is a Gateway
So, (B) → (IV) Gateway
(C) An online textual and multimedia conversation.

This clearly refers to Chatting
So, (C) → (I) Chatting
(D) Private Browsing
The common term for private browsing is Incognito
So, (D) → (III) Incognito

46. While working with text files, each line of a text file is terminated by a special character, called .....

(1) EOF (End of File)
(2) EOL (End of Line)
(3) EOT (End of Text)
(4) EOW (End of Working)

Ans. Option (2) is correct.

Explanation: EOL stands for End of Line.
It refers to the special character(s) that denote the end of a single line in a text file.
Common EOL characters:

Operating System	EOL Character(s)	Description
Linux/Unix	\n	Line Feed (LF)
Windows	\r\n	Carriage Return + Line Feed
macOS (old)	\r	Carriage Return (CR)

These characters help text editors, compilers, and programs know where a line ends so they can process the file correctly.

47. Identify the purpose of the given algorithm:

Step 1: SET i = 0

Step 2: WHILE i < n, REPEAT STEPS 3 to 8

Step 3: SET j = 0

Step 4: WHILE j < n-i-1, REPEAT STEPS 5 to 7

Step 5: IF numList[j] < numList [j + 1] THEN

Step 6: swap (numList[j], numList[j + 1])

Step 7: SET j = j + 1

Step 8: SET i = i + 1

(1) A bubble sort algorithm to sort a list in ascending order.
(2) A selection sort algorithm to sort a list in descending order.
(3) A selection sort algorithm to sort a list in ascending order.
(4) A bubble sort algorithm to sort a list in descending order.

Ans. Option (4) is correct.

Explanation: Step-by-step summary:
Step 1: Initialize i = 0 (outer loop counter).
Step 2: Repeat steps 3–8 while i < n (full outer loop for passes).
Step 3: Initialize j = 0 (inner loop counter).
Step 4: Repeat steps 5–7 while j < n - i - 1
→ This structure is typical of Bubble Sort (it keeps reducing comparisons after each pass).
Step 5: IF numList[j] < numList[j + 1] THEN
→ Swap if the current element is smaller than the next one.
Step 6: Swap numList[j] and numList[j + 1]
→ This means the larger element is moved to the front.
Step 7: Increment j
Step 8: Increment i

Behavior of the Sorting Logic
- It compares adjacent elements.
- It swaps them if the left is smaller than the right (numList[j] < numList[j+1]).
- Hence, larger elements "bubble up" to the front.
- This means the list is being sorted in descending order.

48. Match **List-I** with **List-II**.

List-I	List-II
(A) Primary key	(I) The number of tuples in a relation
(B) Cardinality	(II) To relate two tables or relations.
(C) Foreign Key	(III) Default
(D) Database constraints	(IV) Unique identification of tuples.

Choose the **correct** answer from the options given below:

(1) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
(2) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(3) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (1) is correct.

Explanation: (A) Primary Key
Used to uniquely identify each tuple (record) in a table.
(IV) Unique identification of tuples
(B) Cardinality
Refers to the number of tuples (rows) in a relation (table).
(I) The number of tuples in a relation
(C) Foreign Key
A key used to refer to the primary key in another table, helping relate two tables.
(II) To relate two tables or relations
(D) Database Constraints
These are rules applied to columns like NOT NULL, DEFAULT, CHECK, etc.
(III) Default

49. Which of the following returns a string type value?

(1) mod ()
(2) instr ()
(3) mid ()
(4) Dayofmonth()

Ans. Option (3) is correct.

Explanation: Let's examine each function to determine which one returns a string type value:
1. mod()
Purpose: Returns the remainder after division.

Return Type: Numeric
Not a string
2. instr()
Purpose: Returns the position of a substring within a string.
Return Type: Integer
Not a string
3. mid()
Purpose: Extracts a substring from a string.
Return Type: String
Correct Answer
4. dayofmonth()
Purpose: Extracts the day part (1–31) from a date.
Return Type: Integer
Not a string

50. Which of the following are DDL commands?

(A) ALTER TABLE **(B)** DROP TABLE
(C) UPDATE TABLE **(D)** CREATE TABLE

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only **(2)** (A), (B) and (C) only
(3) (A), (B), (C) and (D) **(4)** (B), (C) and (D) only

Ans. Option (1) is correct.

Explanation: DDL stands for Data Definition Language.
These commands are used to define, modify, or delete database objects such as tables, schemas, and indexes.

Let's examine each option:
(A) ALTER TABLE
Used to modify the structure of an existing table.
DDL command
(B) DROP TABLE
Used to delete a table completely from the database.
DDL command
(C) UPDATE TABLE
Used to modify data within a table (not the structure).
DML (Data Manipulation Language) command
(D) CREATE TABLE
Used to create a new table in the database.
DDL command

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