

Advanced Level – Information and Communication Technology

2019 MCQ Past Paper

(1) bus	A communication system that transfers data between components inside a computer or between computers
(2) cache memory	Holds frequently requested data and instructions so that they are immediately available to the CPU when needed
(3) control unit	Performs the task of controlling functions of the computer
(4) memory management unit	Is responsible for the translation of virtual addresses used by software to physical addresses used in the memory system
(5) register	Fastest memory which CPU can access directly . Store the data that the CPU is currently processing

2. Which of the following represents the bitwise AND operation of the two binary numbers 01010101 and 10101010?

(1) 00000000 (2) 00001111 (3) 11001100 (4) 11110000 (5) 11111111

01010101 10101010 <hr/> 00000000	AND	In AND operation, the output will be 1 if both bits are 1. If not, the output will be 0.
--	-----	--

3. Use of public key and private key in *encryption* and *decryption* processes is called
(1) asymmetric encryption. (2) digital encryption. (3) hybrid encryption.
(4) private key encryption. (5) symmetric encryption.

(1) asymmetric encryption	The sender and recipient use two different keys
(2) digital encryption	Used to protect data from being stolen, changed, or compromised and works by scrambling data into a secret code that can only be unlocked with a unique digital key
(3) hybrid encryption	Combines the efficiency of symmetric encryption with the convenience of public key (asymmetric) cryptography
(4) private key encryption	A cryptographic key used in an encryption algorithm to both encrypt and decrypt data
(5) symmetric encryption	Only one key is used to both encrypt and decrypt electronic data

4. In a particular network, each node is connected directly to a central network device. This topology is referred to as a
(1) bus. (2) hybrid. (3) mesh. (4) ring. (5) star.

1. Ring Topology

- Each device is connected to two other devices on either side via an RJ-45 cable or coaxial cable
- Data flows in one direction

2. Bus Topology

- All devices in the network are connected by one central RJ-45 network cable or coaxial cable
- Suitable for a smaller network
- Data packets can be lost

3. Star Topology

- Every host is connected to a central hub
- Reliable as other device's failure does not affect others
- But without the hub/switch the network fails

4. Mesh Topology

- All the computers are interconnected to every other

5. Consider the following activities related to e-commerce:

- A – online purchase of a pair of shoes
B – online purchase of an e-book of your favourite novel
C – online booking of a taxi to the airport from your home

Which of the above activities represent/s the *pure-click* type business model?

- (1) A only (2) B only (3) C only (4) A and C only (5) B and C only

Types of business organizations	
1. Pure brick	Only physical
2. Brick and click	Both physical and online
3. Pure click	Only online

6. Which of the following shows the correct order of *software testing*?

- (1) acceptance testing → system testing → integration testing → unit testing
- (2) unit testing → acceptance testing → system testing → integration testing
- (3) unit testing → integration testing → acceptance testing → system testing
- (4) unit testing → integration testing → system testing → acceptance testing
- (5) white-box testing → black-box testing → system testing → unit testing

Software Testing Types

1. Unit Testing (Individual units are tested)

- Using white or black box testing
- Before integration testing
- Done by the developers

2. Integrated Testing

- Individual units are combined and tested as a group
- Using white or black testing
- Done by a specific tester or test team

3. System Testing

- Using black box testing
- Done by a team that is independent of the development team in order to measure the quality of the system unbiased

4. Acceptance Testing

- Performed by the end user or the client to verify/ accept the system

7. A software development company identifies that their new system development project has complex requirements and has a *medium* to *high* risk level. Further, an evaluation is needed to clear the requirements and significant changes are expected during system development.

What is the most suitable software development process model for this project?

- | | |
|-----------------------------------|-------------------|
| (1) agile | (2) prototyping |
| (3) rapid application development | (4) <u>spiral</u> |
| (5) waterfall | |

Waterfall model

- First process model to be introduced which is simple to understand and use
 - Requirements have to be well-known, clear and fixed
 - Project is short

Spiral model

- Has four phases → Planning, Risk analysis, Engineering and Evaluation
 - Complex and unsure, unfixed user requirements (Change according to the user time to time)
 - Long term projects

RAD model (Rapid Application Development)

- For systems which are needed in a short span of time
 - User will be involved all through the life cycle
 - Requirements are known but might change

Agile model

- Prioritizes features, continuously gathers customer feedback and adjusts and remains flexible throughout the process

8. Which of the following made a significant contribution to the growth of Information and Communication Technology (ICT) usage?

A - exponential progress of the semiconductor technology paving the way for low cost hardware

B - introduction of user-friendly software and interfaces to computers

C - merge of computer and communication technologies to produce smart and mobile devices

(1) A only

(2) B only

(3) A and C only

(4) B and C only

(5) All A, B and C

9. Which of the following is the correct statement to connect to "login.php" from an HTML form?

(1) <form action =“GET” method =“/login.php”>

(2) <form action =“/login.php” method =“GET”>

(3) <form submit =“GET” method=“/login.php”>

(4) <form submit="/login.php" method="GET">

(5) <form target=""/>/login.php" method="GET">

Example

```
<html>
<body>

<form action="welcome.php" method="post">
Name: <input type="text" name="name"><br>
E-mail: <input type="text" name="email"><br>
<input type="submit">
</form>

</body>
</html>
```

10. Which of the following HTML code lines is correct to create a hyperlink to the words “Department of Examinations” using the URL: <http://www.doe.index.html>?

- (1) http://www.doe.index.html
- (2) Department of Examinations
- (3)
- (4) http://www.doe.index.html
- (5) Department of Examinations

Example

This example shows how to create a link to W3Schools.com:

```
<a href="https://www.w3schools.com/">Visit W3Schools.com! </a>
```

11. On his single processor computer, a user starts a spreadsheet application and creates a new spreadsheet. To get some information required for the spreadsheet he opens a **large** database using his Database Management System (DBMS). After completing his spreadsheet he saves it.

Which of the following operating system features has/have been used by the above user?

- A - context switching
- B - file management
- C - virtual memory

- (1) A only
- (2) B only
- (3) A and B only
- (4) A and C only
- (5) All A, B and C

A – context switching	The process of saving the context of one process and loading the previously saved context of another process
B – file management	Refers to the set of processes and techniques involved in creating, organizing, accessing, manipulating, and controlling file stored on storage devices such as hard drives, solid-state drives, or network storage
C – virtual memory	This technique allows the user to use the hard disk as extra RAM when the physical RAM runs out of space

12. A smart environment can be created by having an interconnected network of hardware devices, sensors, connectivity and required software, which is often referred to as the *Internet of Things (IoT)*. Which of the following statements is correct about IoT?

- (1) Every IoT device or item must be connected using UTP cables.
- (2) If any item of the IoT setup fails to operate the entire IoT setup will be shutdown.
- (3) IoT environments cannot be monitored and controlled remotely.
- (4) Modern smart mobile phones cannot be connected to an IoT setup.
- (5) The Internet connectivity is not essential for an IoT setup to function.

Answer (1)	Incorrect	Using unshielded twisted pair cables are not the only way to connect
Answer (2)	Incorrect	The nature of IoT systems often involves distributed and interconnected devices, and the failure of one device typically should not result in the entire IoT setup shutting down.
Answer (3)	Incorrect	one of the key advantages of IoT is the ability to monitor and control devices and environments remotely. The entire concept of IoT is built on the idea of connecting devices to the internet to enable communication, data exchange, and control from remote locations.
Answer (4)	Incorrect	Smartphones are commonly used as integral components of IoT setups, and they can connect to and interact with IoT devices in various ways.
Answer (5)	Correct	some IoT setups can function without internet connectivity, the role of the internet depends on the specific requirements and design choices made for the IoT application.

13. Which of the following indicates a *non-functional* requirement?

A – A user shall be allowed to upload an image to the system to be used as his/her profile picture.

B – The correct invoice value should be calculated including applicable tax rates at the check-out.

C – The system must satisfy 99.9% availability of service.

- | | | |
|------------------|--------------------|------------|
| (1) A only | (2) B only | (3) C only |
| (4) A and B only | (5) All A, B and C | |

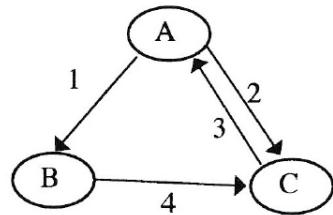
Functional requirements	Non-functional requirements
Requirements which are expected from the system	Requirements which describe how the system work / requirements which enhance the quality of the system
Essential	Nice to have
It is a must to have to fulfill what is expected from the system	It would be better to have to what is expected from the system

A	Functional requirements
B	Functional requirements
C	Non-functional requirements

14. Consider the process transition diagram in the figure:

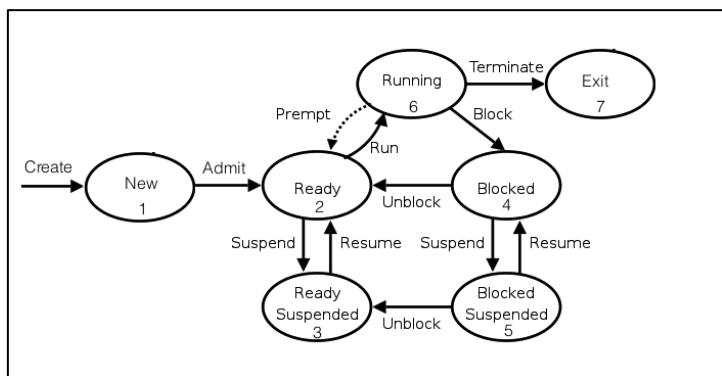
If the transitions shown are as follows:

- 1 – Process blocks for input/output
- 2 – Scheduler picks another process
- 3 – Scheduler picks this process
- 4 – Input/output is completed



then what are the states indicated by the labels A, B and C respectively?

- | | | |
|-----------------------|------------|------------|
| (1) A: Blocked | B: New | C: Ready |
| (2) A: New | B: Ready | C: Running |
| (3) A: Ready | B: Running | C: Blocked |
| (4) A: Running | B: Blocked | C: Ready |
| <u>(5) A: Running</u> | B: New | C: Blocked |



● Consider the following database table to answer the questions 15 to 17.

Student_Sport

Student_Id	Event_Id	Event_Name
10012	S-02	Carrom
10022	S-01	Basketball
10018	S-02	Carrom
10012	S-03	Volleyball
10025	S-04	Chess
10018	S-01	Basketball

15. In which normal form does the above table exist?

- | | | |
|-----------------------|------------------------------|------------------------|
| (1) BCNF | <u>(2) First normal form</u> | (3) Second normal form |
| (4) Third normal form | (5) Zero normal form | |

Zero Normal Form	Not yet normalized. Have repeating attributes (such as author1, author2, author3)
First Normal Form	Primary key is repeated but there is a composite primary key → partial dependency
Second Normal Form	No partial dependencies. Has transitive dependencies → non-prime attribute/ column doesn't depend on the primary key but depends on another non-prime attribute
Third Normal Form	Fully functional dependencies

16. Consider the following statements regarding the above table:

- A - It has a composite primary key.
- B - *Event_Name* attribute is fully dependent on the primary key of *Student_Sport* table.
- C - *Event_Id* is a candidate key.

Which of the above statements is/are correct?

- (1) A only
- (2) B only
- (3) A and B only
- (4) A and C only
- (5) All A, B and C

Candidate Key	<ul style="list-style-type: none">• A column or set of columns in a table that can uniquely identify any record without referring to any other data (can be a primary key)• Each table may have one or more candidate keys but one primary key
---------------	--

17. It is required to add a new field called *Age* to the *Student_Sport* table and the values of the new field must be greater than 10.

Which one is the correct SQL statement to implement the above requirement?

- (1) Alter table *Student_Sport* add check (*Age*> 10);
- (2) Alter table *Student_Sport* add where (*Age*> 10);
- (3) Alter table *Student_Sport* set check (*Age*> 10);
- (4) Update table *Student_Sport* add check (*Age*> 10);
- (5) Update table *Student_Sport* add where (*Age*> 10);

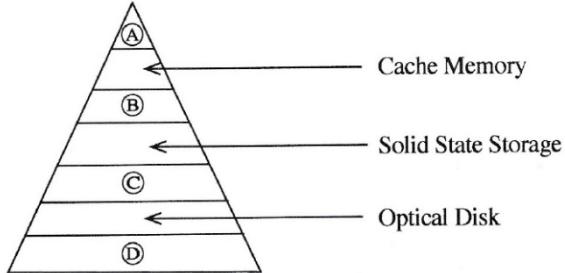
ALL

18. Which of the following SQL commands is **not** available in the Data Manipulation Language (DML)?

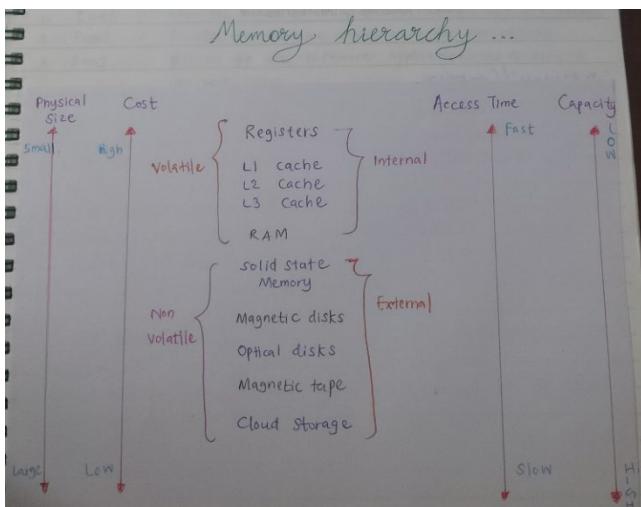
- (1) CREATE
- (2) DELETE
- (3) INSERT
- (4) SELECT
- (5) UPDATE

Data Definition Language (DDL)	Data Manipulation Language (DML)
CREATE	SELECT
ALTER	INSERT
DROP	UPDATE
RENAME	DELETE

19. In the memory hierarchy diagram given, which of the following represents Ⓐ, Ⓑ, Ⓒ and Ⓓ respectively?



- (1) Magnetic Tape, Magnetic (Hard) Disk, Random Access Memory (RAM), Processor Registers
- (2) Processor Registers, Magnetic (Hard) Disk, Random Access Memory (RAM), Magnetic Tape
- (3) Processor Registers, Random Access Memory (RAM), Magnetic (Hard) Disk, Magnetic Tape
- (4) Processor Registers, Random Access Memory (RAM), Magnetic Tape, Magnetic (Hard) Disk
- (5) Random Access Memory (RAM), Processor Registers, Magnetic (Hard) Disk, Magnetic Tape



20. Which of the following represents the result of the binary arithmetic operation of $11001100 - 01010101$?

- (1) 00110011
- (2) 01100110
- (3) 01110111
- (4) 10011001
- (5) 10101010

$ \begin{array}{r} 11001100 \\ - 01010101 \\ \hline 01110111 \end{array} $

21. Which of the following statements is/are correct about two's complement?

- A - Subtraction is carried out as addition.
- B - Calculations are more efficient.
- C - It is possible to represent negative numbers within the two's complement.

- (1) A only
- (2) B only
- (3) A and B only
- (4) B and C only
- (5) All A, B and C

22. Which of the following statements correctly describe/describes *hackers*?

- A - They are bored and lonely anti-social teenagers who attack computer systems as a challenge and sometimes for profit.
 - B - They are IT skilled people who attack computer systems of individuals and businesses as a form of competition.
 - C - They are organized crime groups that deploy highly automated and sometimes highly targeted attacks against computer systems of individuals and businesses for certain benefits.

23. Which is the most suitable HTML form element input type in which the user can enter his credit card secret number?

The `<input type="password">` defines a password field (characters are masked).

Note: Any forms involving sensitive information like passwords should be served over HTTPS.

24. Consider the following statements regarding the Extended Entity Relationship (EER) model.

- A - EER model includes all the concepts of the original ER model.
 - B - EER model has additional concepts of specialization/generalization.
 - C - EER model includes a new concept to model the weak entities.

Which of the above statement/s is/are correct?

1. EER → Expansive version of ER diagrams
 2. An EER diagram provides you *with all the elements of an ER diagram* while adding:

- Attribute or relationship inheritances
 - Category or union types
 - Specialization and generalization
 - Subclasses and superclasses

25. Which of the following are the properties of a signal?

- (1) Amplitude, Clock time, Frequency and Wavelength
- (2) Amplitude, Frequency, Phase and Time
- (3) Amplitude, Frequency, Phase and Wavelength
- (4) Amplitude, Frequency, Time and Wavelength
- (5) Amplitude, Impulse, Phase and Wavelength

- Amplitude <ul style="list-style-type: none">• Maximum height of the signal• Measured in volts
- Frequency <ul style="list-style-type: none">• Number of oscillations (cycles) in one second• Measured in Hertz (Hz)
- Phase <ul style="list-style-type: none">• Marks the position of the wave with respect to time zero• Describes the amount by which the waveform shifts forward or backward along the time axis
- Wavelength <ul style="list-style-type: none">• Distance between consecutive corresponding points of the same phase such as crests, troughs

26. Which of the following options contains only *guided media*?

- (1) Coaxial, Fiber optics and Infrared
- (2) Coaxial, Fiber optics and Microwave
- (3) Coaxial, Fiber optics and Twisted pair
- (4) Coaxial, Infrared and Twisted pair
- (5) Fiber optics, Satellite communication and Twisted pair

Guided Media	Unguided Media
A medium that sends signals through a solid physical path	A medium that sends signals through free space
<ul style="list-style-type: none">• Twisted pair• Coaxial cables• Fiber-optic cable	<ul style="list-style-type: none">• Radio waves• Microwave• Satellite

27. The *frequency modulation* technique is used to change only

- (1) the amplitude and frequency.
- (2) the amplitude, frequency and phase.
- (3) the amplitude and phase.
- (4) the frequency.
- (5) the frequency and phase.

Frequency Modulation

The process of transmitting information over a carrier wave by varying its frequency in accordance with the amplitude of the message signal

Only the frequency of the carrier signal is varied. Amplitude of it remains constant

More resistant to noise than amplitude modulation

28. Which of the following is a valid example for a PHP variable name?

- (1) $@class_name$ (2) $\&class_name$ (3) $$class\ name$
(4) $$class_name$ (5) $_class_name$

Answer (1)	Incorrect	The variable name should start with '\$'
Answer (2)	Incorrect	The variable name should start with '\$'
Answer (3)	Incorrect	The variable name should not have a space in between
Answer (4)	Correct	
Answer (5)	Incorrect	The variable name should start with '\$'

29. What is the binary equivalent to decimal 54.25 ?

- (1) 00011111.11 (2) 00101010.01 (3) 00110110.01
(4) 00111011.1 (5) 00111110.1

Step 1: Convert 54 to binary

Step 2 : Convert 0.25 to binary

$$\begin{array}{r} 0.25 \times 2 = 0,50 \\ 0.50 \times 2 = 1.00 \end{array}$$

Binary representation of 54: 110110

Binary representation of 0.25: 0.01

30. Which of the following is a valid example for CSS **class** selectors?

- (1) .myclass{color:blue;font-family:serif;}
- (2) #myclass{color:blue;font-family:serif;}
- (3) myclass{color:blue;font-family:serif;}
- (4) myclass:{color:blue;font-family:serif;}
- (5) myclass;{color:blue;font-family:serif;}

Example

Select and style all elements with class="intro":

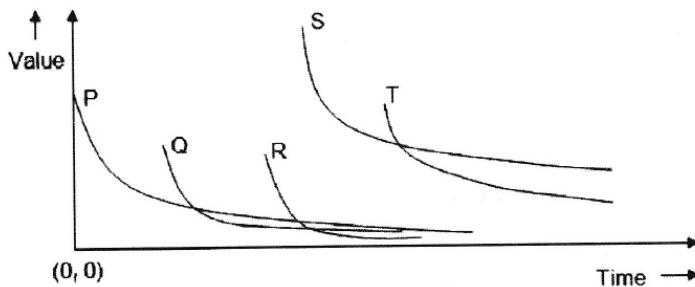
```
.intro {  
    background-color: yellow;  
}
```

31. Which one of the following is **false** regarding the HTML form methods GET and POST?

- (1) Both methods are used to transfer data from client side to the server.
- (2) GET method is more efficient than the POST method.
- (3) GET method is more suitable to send sensitive data.
- (4) POST method does not have a limit on size of data.
- (5) POST requests cannot be bookmarked.

GET method	POST method
Appends the data to the URL while passing them to the server	Encodes the form data into the HTTP request body
Refreshing the page or pressing back button does not affect GET method submitted data	Pressing back button or refreshing cause the resubmission of data
Limited (3000)	No size limitations
Good for non-sensitive data	For sensitive data
Can be bookmarked	Cannot be bookmarked
Gets stored and remains in browser history	Caching not possible

32. The diagram shows the variation of value of information with time for five events of a single mission in the chronological order. Information about the entire mission especially about the occurrences of each event is made available on-line real time.

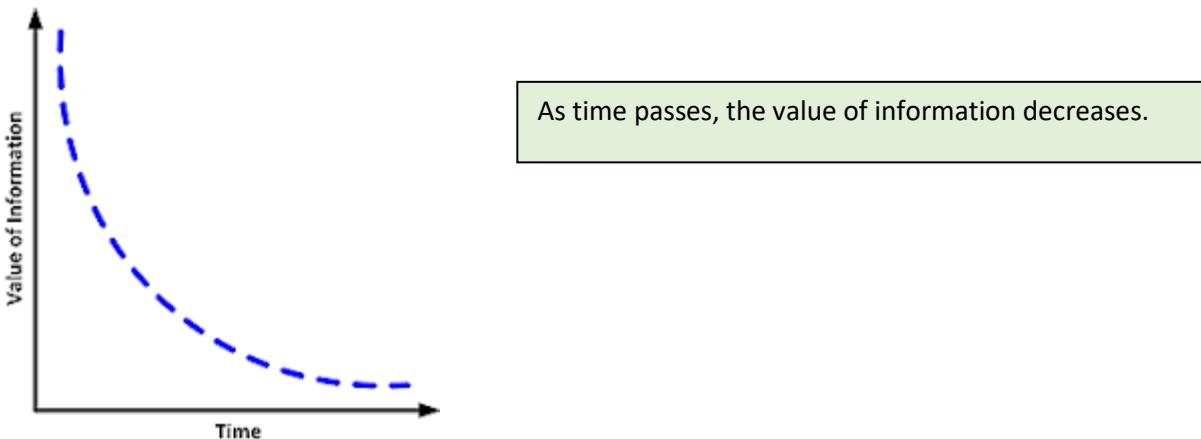


Consider the following statements related to the above mission:

- A - Only the events P, Q and R comply with the Golden Rule of Information.
- B - Event S has the highest demand and needs to be facilitated with the highest technical resources.
- C - The value of an event can be determined reasonably using the demand for the information about the particular event.

Which of the above statements related to this mission is/are valid?

- | | | |
|-------------------------|--------------------|------------------|
| (1) A only | (2) C only | (3) A and B only |
| <u>(4) B and C only</u> | (5) All A, B and C | |



33. Consider the following statements related to *nature inspired computing*:

- A – In *nature inspired computing* natural phenomena/scenario are observed and used to design and develop computing models to solve complex problems.
- B – Artificial Intelligence can use *nature inspired computing* for improving its ability to understand and solve computationally challenging problems.
- C – Computing models and algorithms developed under *nature inspired computing* can only be used in natural environments such as rain forests, oceans and wild-life sanctuaries.

Which of the above statements is/are **incorrect**?

- | | | |
|-------------------------|--------------------|------------|
| (1) A only | (2) B only | (3) C only |
| <u>(4) A and C only</u> | (5) All A, B and C | |

Nature inspired computing, or NIC, is a very new discipline that strives to develop new computing techniques through how naturally occurring phenomena behave to solve complex problems in various environmental situations

34. What is the correct statement related to system deployment?

- (1) Direct deployment is the most complex and the slowest form of deployment.
- (2) In pilot deployment, all the users have the ability to use the system at the beginning.
- (3) In parallel deployment old and new systems are used at the same time.
- (4) Phased deployment do not allow users to develop skills required for new system gradually.
- (5) Phased deployment means the entire system is used in one location.

Direct	Old system is discontinued and the new system will be used from that point onwards
Phase	Parts of the new system are implemented one by one over the time
Parallel	Old and new systems are used at the same time
Pilot	Entire system is used in one location

35. Consider the following statements:

- A – A *hub* connects only the networked computers but a *switch* connects multiple devices.
- B – A *switch* manages the ports and the VLAN security settings.
- C – In data transmission, a *hub* uses bits while a *switch* uses frames and packets.
- D – The data transmission speed in a *hub* is higher than that in a *switch*.

Which of the above statements are correct?

- (1) A, B and C only
- (2) A, B and D only
- (3) A, C and D only
- (4) B, C and D only
- (5) All A, B, C and D

Network Hub	Net Switch
A networking device that connects multiple PCs to a single network	Connects multiple devices on a single computer network
Operates on physical layer → Bits	Operates on data link layer → frames
Not considered as an intelligent device	Considered as an intelligent device
Comparatively slower	Comparatively faster

36. Consider the following statements about the *proxy server*:

- A – It helps to hide the true IP address.
- B – It is used to restrict the access of the website in the network.
- C – It uses the cached data for the quick loading of regularly accessed websites.
- D – It helps to detect the locations of the visitors and load web pages as per their needs.

Which of the above statements are correct?

- (1) A, B and C only
- (2) A, B and D only
- (3) A, C and D only
- (4) B, C and D only
- (5) All A, B, C and D

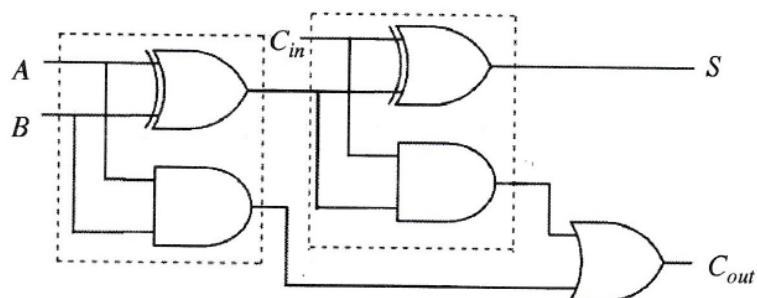
Proxy Server

- A server acts as an intermediary for requests from clients seeking resources from other servers

Requirement of proxy server

1. To control internet usage of employees and children
2. Bandwidth savings and improved speed
3. Privacy benefits
4. Improved security

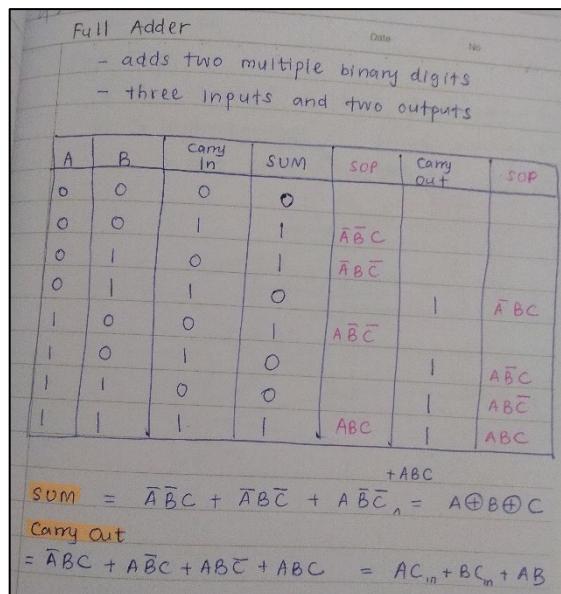
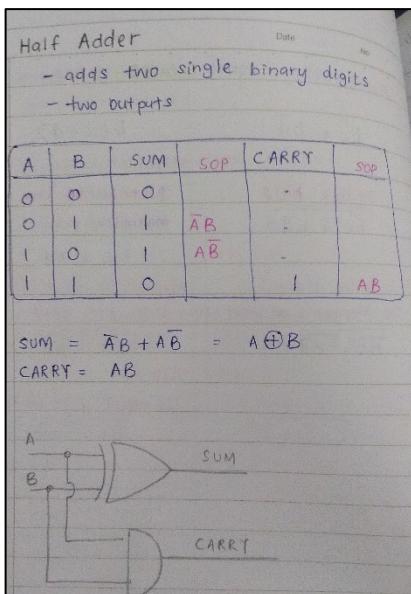
- Consider the following logic circuit diagram to answer the questions **37** and **38**:



37. Which of the following statements is/are correct about the above circuit?

- I - It implements a full adder.
 - II - The logic function of S can be stated as $S = A \oplus B \oplus C_{in}$.
 - III - The logic function of C_{out} can be stated as $C_{out} = AB + BC_{in} + AC_{in}$.
- (1) I only
 - (2) II only
 - (3) I and II only
 - (4) II and III only
 - (5) All I, II and III

38. Which of the following statements is/are correct about the part of the circuit within the area surrounded by the dotted line?

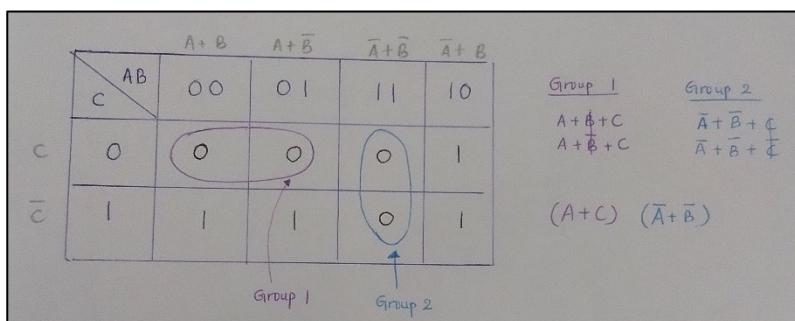


39. Consider the Karnaugh map shown below:

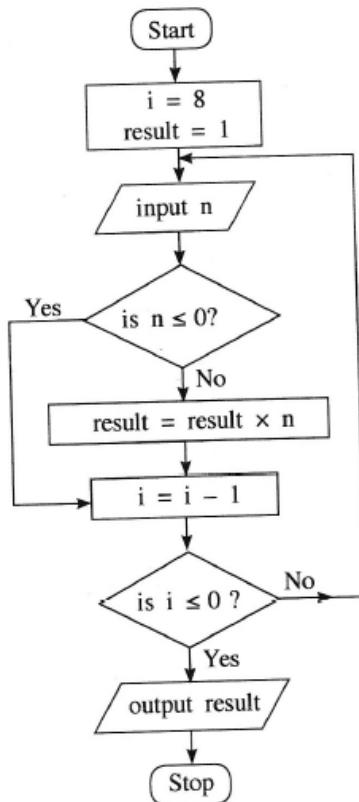
		AB			
		00	01	11	10
C	0	0	0	0	1
	1	1	1	0	1

Which of the following is the correct logic expression that corresponds to the two marked segments on the Karnaugh map?

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



- Consider the following flowchart to answer the questions 40 to 42:



40. Which of the following statements is/are correct about the algorithm expressed by the flowchart?

- A – It takes 8 inputs.
 B – It outputs the product of the positive numbers in the input.
 C – If every input is zero, then the output will be zero.
 (1) A only (2) B only (3) C only (4) A and B only (5) B and C only

A	Correct	Takes 8 inputs
B	Correct	Computes the product of positive numbers in the input
C	Incorrect	Output will be 1

41. If the following is fed as the input to the algorithm, what will be the output?

- 3 2 -4 4 1 -9 5 -6 -1
 (1) -25920 (2) -216 (3) 120 (4) 216 (5) 25920

i	result	n	n<=0	result = result * n	i = i - 1	i<=0	result
8	1	3	3 <=0 (No)	3 = 3 * 1	7 = 8 -1	7 <=0 (No)	
		2	2 <=0 (No)	6 = 3 * 2	6 = 7 - 1	6 <=0 (No)	
		-4	-4 <=0 (Yes)	-	5 = 6 - 1	5 <=0 (No)	
		4	4 <=0 (No)	24 = 6 * 4	4 = 5 - 1	4 <=0 (No)	
		1	1 <=0 (No)	24 = 24 * 1	3 = 4 - 1	3 <=0 (No)	
		-9	-9 <=0 (Yes)	-	2 = 3 - 1	2 <=0 (No)	
		5	5 <=0 (No)	120 = 24 * 5	1 = 2 - 1	1 <=0 (No)	
		-6	-6 <=0 (Yes)	-	0 = 1 - 1	0 <=0 (Yes)	120
		-1					

42. Which of the following Python programs has/have the same functionality (i.e., the same output for a given input) as the algorithm in the flowchart above?

A – i = 8
 result = 1
 while (i > 0):
 n = int(input())
 if (n > 0):
 result = result * n
 i = i - 1
 print (result)

B – result = 1
 for i in range(8):
 n = int(input())
 if (n > 0):
 result = result * n
 print (result)

C – result = 1
 i = 8
 while 1:
 n = int(input())
 if (not(n <= 0)):
 result = result * n
 i = i - 1
 if (i <= 0):
 break
 print (result)

- (1) A only (2) B only (3) C only (4) A and B only (5) All A, B and C

43. Which of the following statements is correct?

- (1) A high level language program that is translated into machine code and executed on computer X will not execute on another computer having the same processor as X .
- (2) A program in a high-level language must be first converted into assembly language code before converting into machine code.
- (3) Interpreted programs run faster than compiled ones.
- (4) Programs in some high-level languages are translated into a form called byte-code because such byte-codes execute faster than machine codes obtained by usual compilations.
- (5) Some modern processors execute programs in high-level languages without translating them into machine code.

ALL

Compiler	Interpreter	Assembler
Converts the whole source code in one session and reports all the errors afterwards	Converts the source code line by line and reports an error as soon as it is found	Translates assembly language to machine language

44. What is the value of the following Python expression?

$$(100 // 3) \% 4 | 8$$

- (1) 0 (2) 0.125 (3) 3 (4) 8 (5) 9

$$(100 // 3) \% 4 | 8$$

$$33 \% 4 | 8$$

$$\begin{array}{r} 1 \quad | \quad 8 \\ \text{OR} \quad \begin{array}{r} 0001 \\ \underline{1000} \\ 1001 \end{array} \end{array}$$

Python Operator Precedence	
()	
**	
*	, /, %, //
+	, -, +
<<	, >>
&	
^	
<, <=, >, >=, !=, ==	
not	
and	
or	
Left shift <<	add to the end
a = 60	# 60 = 0011 1100
c = a << 2	# 240 = 0011 110000
Right shift >>	remove from the right side
a = 15	# 15 = 1111
c = a >> 2	# 3 = 11

45. What will be the output if the following Python code is executed with “abcabc” as the input?

```
result = 1
s = input()
if (len(s) > 3):
    result = 2
if (len(s) < 6):
    result = 3
elif (len(s) > 6):
    result = 4
else:
    result = 5
print(result)
```

- (1) 1 (2) 2 (3) 3 (4) 4 (5) 5

result	s	len(s)>3	result = 2	len(s) < 6	result = 3	len(s)>6	result = 4	result = 5	result
1	abcabc	6>3 (Yes)	2	6<6 (No)	-	6>6 (No)	-	5	5

If statements

All the if conditions in a python code will be checked. But elif will be checked only if the if conditions or elif conditions before it is false.

else will be executed if the if and elif statements before are false.

46. What will be the output of the following Python code?

```
x = 100
for i in range(1,5):
    x = x - i
print(x)
```

- (1) 0 (2) 5 (3) 85 (4) 90 (5) 100

x = 100	for i in range (1,5)	x = x - i	x
100	1	99 = 100 - 1	
	2	97 = 99 - 2	
	3	94 = 97 - 3	
	4	90 = 94 - 4	90
	5 (Stops before 5)		

47. What will be the output of the following Python code segment?

```
L = [1,-2,4,3,2,-7,11,2,8,-1]
x = 0
for i in range(len(L)):
    if (L[i] < 0):
        continue
    if (L[i] > 10):
        break
    x = x + L[i]
print(x)
```

- (1) 0 (2) 1 (3) 10 (4) 21 (5) 31

len(L)	x	for i in range(len(L))	L[i]<0	continue	L[i]>10	break	x = x + L[i]	x
10	0	0	1<0 (No)	-	1>10 (No)	-	1 = 0 + 1	
		1	-2<0 (Yes)	continue	-	-	-	
		2	4<0 (No)	-	4>10 (No)	-	5 = 1 + 4	
		3	3<0 (No)	-	3>10 (No)	-	8 = 5 + 3	
		4	2<0 (No)	-	2>10 (No)	-	10 = 8 + 2	
		5	-7<0 (Yes)	continue	-	-	-	
		6	11<0 (No)	-	11> 10(Yes)	break	-	10
		7	2<0					
		8	1<0					
		9	8<0					
		10	-1<0					

48. What will be the result when the following Python code is executed?

```
x = 50
def func(y):
    x = 2
    y = 4
func(x)
print(x)
```

- (1) 50 (2) 2 (3) 4 (4) syntax error (5) name error

The print statement indicates to output x. Therefore 50 will be printed

49. Which of the following is **not** an information stored in a *Process Control Block (PCB)* of the operating system?

- (1) free disk slots (free disk blocks that could be utilized by the process)
- (2) memory management information for the process
- (3) program counter (address of the next instruction to be executed for the process)
- (4) process identification number (unique identifier for the process)
- (5) process state (e.g., Blocked, Ready, etc.)

Process Control Block (PCB)

A data structure maintained by OS for every process throughout each process's lifetime and is deleted after the process is terminated.

Contains: (Context of the process)

1. An ID number that identifies the process
2. The current state of the process → whether it is ready/blocked/....
3. Program Counter → A pointer to the address of the next instruction to be executed for this process
4. A list of files opened by the process
5. The priority of the process
6. The I/O devices needed by the process
7. CPU registers → Various CPU registers where process need to be stored for execution for running and value of registers during execution

50. Consider the following SQL statement:

Update school set contact_person='Sripal W.' where school_id='04';

Which of the following is true when the above SQL statement is executed?

- (1) It adds an additional field with the name *contact_person* and adds value into that new field as 'Sripal W.' only in the records having *school_id* = 04
- (2) It adds an additional value to the *contact_person* as 'Sripal W.' only in the records having *school_id* = 04
- (3) It changes the field name of *contact_person* as 'Sripal W.' when selecting the records with *school_id* = 04
- (4) It changes the value of *contact_person* as 'Sripal W.' only in the records having *school_id* = 04
- (5) It selects all the records having *school_id* = 04 and *contact_person* as 'Sripal W.'