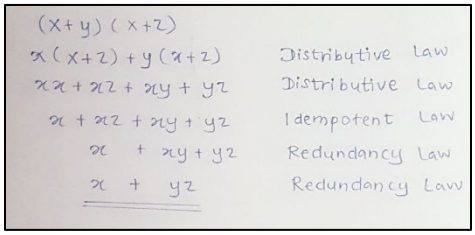
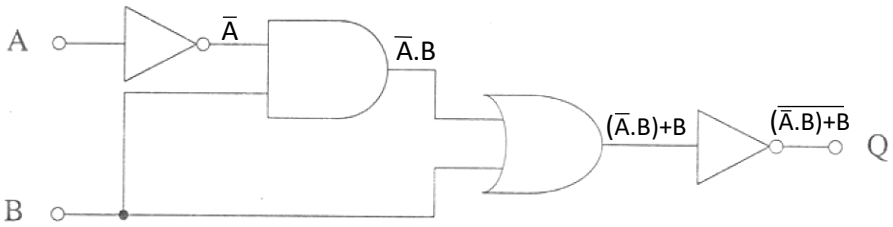
# Advanced Level – Information and Communication Technology
## 2013 MCQ Past Paper

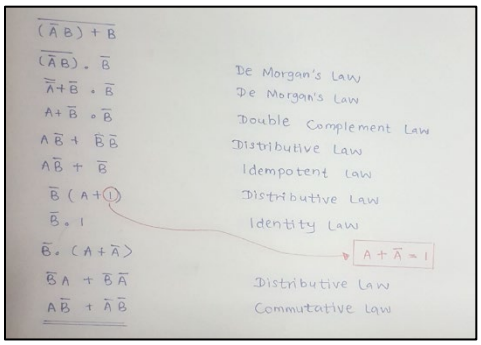
1. The Boolean expression $(x+y).(x+z)$ simplifies to .....
   (1) x . (2) $x.(y+z)$ (3) $x.y.z$ (4) $x+y.z$ (5) $x+y+z$




2. Which of the following Boolean expressions represents the output (Q) of the circuit shown below? A and B are inputs.

   (1) $A'.B'+A.B'$
   (2) $A'.B'+A.B$
   (3) $A.B+A'.B'$
   (4) $A'.B+A.B'$
   (5) $A'.B+A'.B'$




3. A high speed temporary storage, which is a part of the microprocessor that holds data and instructions during the execution, is called .....
   (1) Registers. (2) RAM. (3) Virtual Memory.
   (4) EPROM. (5) Flash Memory.

| | |
|---|---|
| (1) Registers | Are small amount of fast storage element which are used to store data temporarily for processing and transfer |
| (2) RAM | Essentially short term memory where data is stored as the processor needs it (volatile) |
| (3) Virtual Memory | Space from the secondary storage is temporary given when the space in the RAM is not sufficient. |
| (4) EPROM **(Erasable programmable read-only memory)** | Is a type of memory chip that retains its data when its power supply is switched off. Once programmed, an EPROM can be erased by exposing it to strong ultraviolet light source |
| (5) Flash Memory | A computer memory storage medium that can be electronically erased and reprogrammed that is non-volatile. |

4. Microprocessors are usually compared by their clock speed, measured in ..... or by their word size, measured in ..... that can be processed in a single clock cycle. Which of the following is most appropriate to fill the blanks in the above statement?

(1) Bits, Megahertz (2) Bytes, Gigahertz (3) Gigahertz, Bytes
(4) Megahertz, Bits (5) Seconds, Bits

| | |
|---|---|
| Clock speed of a microprocessor | • Refers to the number of cycles a CPU performs per second<br>• Measured in Hz, MHz or GHz |
| Word size of a microprocessor | • Refers to the amount of data a CPU's internal data registers can hold and process at one time<br>• Measured in bits |

5. Typically the cache memory is used to store .....

(1) a large volume of data temporarily. (2) the least frequently accessed data permanently
(3) the least frequently accessed data temporarily. (4) the most frequently accessed data temporarily
(5) the most frequently accessed data permanently.

**Cache Memory**

An extremely fast temporary memory type that acts as a buffer between RAM and CPU.

Holds frequently requested data and instructions so that they are immediately available to the CPU when needed.

6. Sharing a single microprocessor among number of application programs using context switching is known as

(1) Multi-user processing. (2) Multitasking. (3) Multiprocessing.
(4) Batch processing. (5) Online processing.

| | |
|---|---|
| (1) Multi-user processing | Allows access to multiple users to use the computer's resources simultaneously |
| (2) Multitasking | Allows several programs to run at the same time on a processor |
| (3) Multiprocessing | Having more than one program in memory |
| (4) Batch processing | The method computers use to periodically complete high-volume, repetitive data jobs |
| (5) Online processing | The ongoing entry of transactions into a computer system in real time |

7. Babbage's Difference Engine is based on .....

(1) mechanical technology.
(2) vacuum tube technology.
(3) transistor technology.
(4) Integrated Circuit (IC) technology.
(5) Very Large Scale Integrated (VLSI) Circuit technology.

| | |
|---|---|
| (1) Mechanical technology | Mechanical age (1450 – 1840) |
| (2) Vacuum tube technology | First Generation (1940 – 1956) |
| (3) Transistor technology | Second Generation (1956 – 1963) |
| (4) Integrated Circuit (IC) technology | Third Generation (1964 – 1975) |
| (5) Very Large Scale Integrated (VLSI) Circuit technology | Fourth Generation (1976 – 1989) |

- Charles Babbage introduced Difference Engine in Mechanical age

8. Which of the following components is located outside the microprocessor?

(1) Arithmetic Logic Unit (ALU)
(2) RAM
(3) Control Unit
(4) Registers
(5) Level 1 cache memory

| | |
|---|---|
| (1) ALU | Located inside the Microprocessor / CPU |
| (2) RAM | Located on the Motherboard |
| (3) Control Unit | Located inside the CPU |
| (4) Registers | Located inside the CPU |
| (5) Level 1 cache memory | Located inside the CPU |
| Level 2 cache memory | Located inside the CPU / CPU housing / Motherboard |
| Level 3 cache memory | Located on the CPU housing / Motherboard |

9. Which of the following is an **incorrect** Karnaugh Map layout to represent a Boolean function of four (4) Boolean variables a, b, c and d?

(1)

| ab\cd | 01 | 00 | 10 | 11 |
|---|---|---|---|---|
| 01 | | | | |
| 00 | | | | |
| 10 | | | | |
| 11 | | | | |

(2)

| ac\bd | 01 | 00 | 10 | 11 |
|---|---|---|---|---|
| 01 | | | | |
| 00 | | | | |
| 10 | | | | |
| 11 | | | | |

(3)

| ab\cd | 01 | 00 | 11 | 10 |
|---|---|---|---|---|
| 01 | | | | |
| 00 | | | | |
| 11 | | | | |
| 10 | | | | |

(4)

| ad\bc | 11 | 10 | 00 | 01 |
|---|---|---|---|---|
| 11 | | | | |
| 10 | | | | |
| 00 | | | | |
| 01 | | | | |

(5)

| ac\bd | 00 | 10 | 11 | 01 |
|---|---|---|---|---|
| 00 | | | | |
| 10 | | | | |
| 11 | | | | |
| 01 | | | | |

10. What is the output of the following Python program?

```
s = "Nimal Perera"
print(s[1:3])
```

(1) Ni (2) im (3) ra (4) er (5) Pe

| Letter | N | **i** | **m** | a | l | | P | e | r | a | r | a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Index | 0 | **1** | **2** | **3** | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

print(s[**1**:**3**]) → prints from index 1 to index 2

Starts from index 1

Ends before index 3 (stops printing: one before the defined index)

11. Which of the following is a valid Python statement that can be used to open a file called "output.txt" so that new data can be added to the end of the file without deleting its original content?

(1) `open = infile ("output.txt","r")` (2) `infile = open ("output.txt","r")`
(3) `infile = open ("output.txt","a")` (4) `open = infile ("output.txt","a")`
(5) `infile = open ("output.txt","w")`

| **How to open a file** :<br>f = open ("filename.txt", "mode") f is the variable name | |
|---|---|
| **File modes :** | |
| r Read only | **Default, Text file have to exist** |
| r+ Reading and writing | **Text file have to exist** |
| w Writing only | **Replace the previous content** |
| w+ Writing and reading | **Replace the previous content** |
| a Appending | **Add the new content to the end of the current content (Does not replace)** |

12. Consider the following Python statements:

```
a = "123"
b = 123
c = ['a',2,(1,2,3)]
```

What are the data types of the variables a, b and c, respectively?

(1) List, Integer, String (2) String, Integer, List (3) Integer, Integer, List
(4) String, String, String (5) String, Float, Tuple

| Examples for.. | |
|---|---|
| List | [1, 2, "bat", (3, 8, 20)] |
| Integer | 564, 2, 7458, 1108 |
| String | "Tomorrow", "94560", "One sunny day" |
| Float | 41.5, 87.65 |
| Tuple | ( (5,9), [98,6], "Hello world" ) |

13. What will be the output when the following Python code is executed?

```
x = 6
while x > 0:
    x = x - 2
    print(x, end = ' ')
```

(1) 6 (2) 4 2 (3) 2 4 6 (4) 4 2 0 (5) 0

| x=6 | while x>0 | x=x-2 | print(x, end= '') |
|---|---|---|---|
| x=6 | 6>0 (Yes) | 4=6-2 | 4 |
| | 4>0 (Yes) | 2=4-2 | 4 2 |
| | 2>0 (Yes) | 0=2-2 | 4 2 0 |
| | 0>0 (No) | - | stops |

14. Which of the following is an invalid Python identifier?
(1) _name (2) Name (3) Name_ (4) 6Name (5) _6_names

| Rules for naming variables |
|---|
| 1. Any name can be given to a variable. But they have to meaningful and precise |
| 2. The first character must be a letter or an underscore (_) But **can't** use a number as the first character |
| 3. The rest of the variable can include any letter, any number, or the underscore. Can't use any other characters including spaces, symbols and punctuation marks. |

15. Consider the following Python program:

```
a = [1, 2]
b = [3, 4]
c = a + b
print(c)
```

What is the output?
(1) [4, 6] (2) 10 (3) [1, 2, 3, 4] (4) [[1, 2], [3, 4]] (5) [1, 2] + [3, 4]

| Can be added | Cannot be added |
|---|---|
| Two lists, two strings, two tuples | Two dictionaries, two sets |

16. What is the value after executing the Python expression $10 - 3 * 2 + 2.0$?
(1) 16 (2) 16.0 (3) 6 (4) 6.0 (5) 28

10 – **3 * 2** + 2.0
**= 10 – 6** + 2.0
= 4 + 2.0
= 6.0

Python Operator Precedence

()
**
*, /, %, //
+, -
<<, >> (Left Shift, Right Shift)
& (Bitwise AND)
^ (Bitwise XOR)
| (Bitwise OR)
<, <=, >, >=, !=, ==
not
and
or

When you get these, which are in the same order, in a python expression, you have to solve the expression from left to right (The second line of this question in an example)

17. Which of the following is a syntactically correct Python program?

(1)
```
def max(a, b)
    if(a > b)
        return a
    else
        return b
```

(2)
```
def max(a, b):
    if(a > b):
        return a
    else:
        return b
```

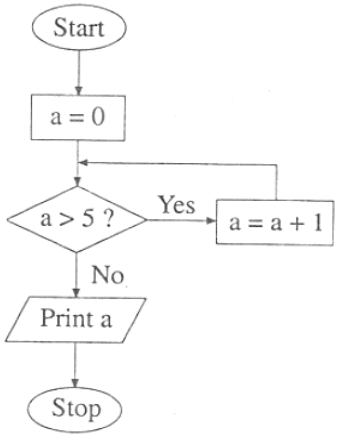
(3)
```
def max(a, b)
    if(a > b) then return a
    else return b
```

(4)
```
def max(a, b)
    if(a > b):
        return a
    else:
        return b
```

(5)
```
function max(a, b):
    if(a > b):
        return a
    else:
        return b
```

| | | |
|---|---|---|
| Answer (1) | Incorrect | Missing ":" in line 1, line 2 and line 4 |
| Answer (2) | Correct | |
| Answer (3) | Incorrect | Missing ":" s and incorrect indentation |
| Answer (4) | Incorrect | Missing ":" in line 1 |
| Answer (5) | Incorrect | Starting from "**function"** is an incorrect way of defining a function |

- Use the following flowchart to answer the questions **18** and **19**.




18. What is the output of the algorithm represented by this flowchart?
(1) 0
(2) 5
(3) 4
(4) 10
(5) 15

19. Which of the following Python programs correctly represents this flowchart?

(1)
```
a = 0
while (a > 5):
    a = a + 1
    print(a)
```

(2)
```
a = 0
while (a > 5):
    a = a + 1
print(a)
```

(3)
```
a = 0
while not (a > 5):
    a = a + 1
print(a)
```

(4)
```
a = 0
while not (a > 5):
    a = a + 1
    print(a)
```

(5)
```
a = 0
while (a <= 5):
    a = a + 1
    print(a)
```

18.

| a=0 | a>5 | a=a+1 | print a |
|---|---|---|---|
| 0 | 0>5 (No) | - | 0 |

19.

| | | |
|---|---|---|
| Answer (1) | Incorrect | Printing the output inside the loop does not provide what we expect from the flow chart |
| Answer (2) | Correct | |
| Answer (3) | Incorrect | The loop should be executed within the condition a>5 for us get the expected output |
| Answer (4) | Incorrect | The loop should be executed within the condition a>5 for us get the expected output and the output have to print outside the loop |
| Answer (5) | Incorrect | The while loop condition in incorrect. And the output statement have to be outside the loop |

20. The binary number equivalent to the $25_{10}$ is

(1) 0100101. (2) 0100111. (3) 0011001. (4) 0010110. (5) 0010111.

21. $124_8 + 165_8 =$

(1) $201_8$ (2) $289_{10}$ (3) $289_8$ (4) $311_8$ (5) $389_8$

22. Consider the following attributes related to business:

A - Speed of services
B - Purchase and distribution
C - Security of goods sent
D - Confidence in quality of items ordered

Which of the above is/are disadvantage(s) of e-business?

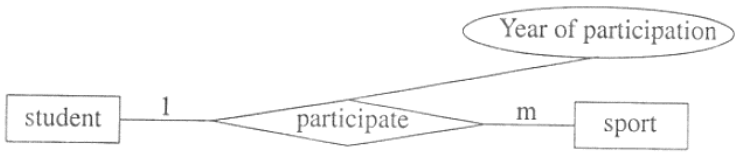
(1) A only (2) C only (3) A and B only
(4) C and D only (5) All A, B, C and D

| Advantages of e-business | Disadvantages of e-business |
|---|---|
| 1. Worldwide presence | 1. Lack of personal touch |
| 2. Reduces time and money spent | 2. Delivery time |
| 3. Efficient customer service | 3. Security issues |
| 4. Shows the seller how to improve | |

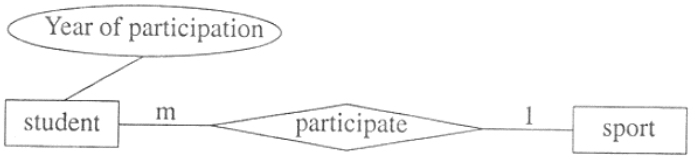
| | | |
|---|---|---|
| Answer (A) | Advantage | Online purchasing is more efficient for most of the services are automated. Therefore, the speed of the services is high as well. |
| Answer (B) | Advantage | As we can easily buy what we want easily at any time |
| Answer (C) | Disadvantage | The goods may be damaged when we receive |
| Answer (D) | Disadvantage | The photo shown may not be the same as what get |

23. Which of the following is the most appropriate Entity Relationship (ER) diagram to represent students' participation in different sports in school?

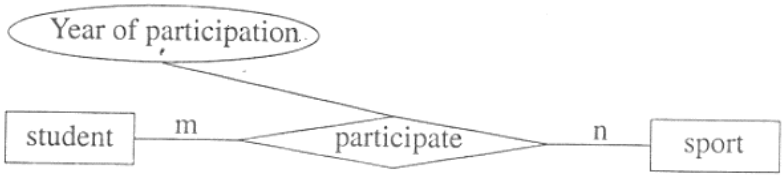
(1)



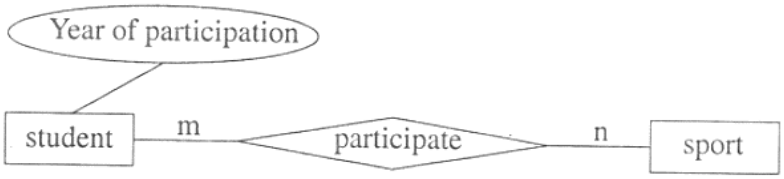

(2)



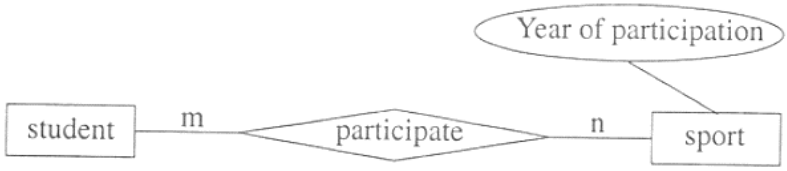

(3)




(4)




(5)




- The two entities here are student and sport. The relationship between these entities is participation.
- The question hints that one student plays different sports. And also, a sport is being played by different students. So, the cardinality between these entities can be stated as Many to Many.
- Year of participation differ from one student to another and also differ from one sport to another. Therefore, this attribute have to be attached to the relationship.

24. Which of the following can be considered as an expert system?
(1) A bank teller machine
(2) A fully automatic washing machine
(3) A microwave oven
(4) A diagnosis system of a health care facility
(5) An electronic blood pressure meter

| **Definition of an expert system** |
|---|
| A type of software which uses databases of expert knowledge to offer advice or make decisions in such areas as medical diagnosis |

25. Which of the following is a testing strategy which considers the internal implementation of a program into account?
(1) Black box testing
(2) White box testing
(3) Integration testing
(4) Acceptance testing
(5) Unit testing

| **Software testing techniques/ strategies** | **Software testing types** |
|---|---|
| 1. White box testing:<br>• To find errors in the code | 1. Unit Testing (individual units are tested)<br>2. Integrated Testing (individual units are combined and tested as a group)<br>3. System Testing<br>4. Acceptance Testing |
| 2. Black box testing<br>• Checks whether the expected output is provided<br>• No need to know programming languages | |

| Internal implementation of a program means considering **the base** (the code) of the program |
|---|

26. Which of the following information system development models has an extremely short and linear development process?
(1) Waterfall model
(2) Object-Oriented model
(3) Spiral model
(4) Incremental Development model
(5) Rapid Application Development model

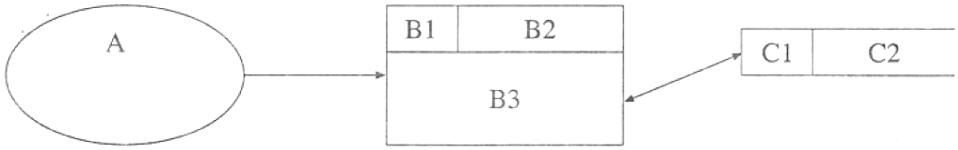
| | |
|---|---|
| (1) Waterfall model | Suitable for systems which are simple to understand and use |
| (2) Object-Oriented model | The construction of objects using a collection of objects that contain stored values of the instance variables found within an object |
| (3) Spiral model | Suitable for complex and unsure user requirements |
| (4) Incremental Development model | A process of software development where requirements divided into multiple standalone modules of the software development cycle |
| (5) Rapid Application Development model | Suitable for systems which are needed in a short span of time |

27. Which of the following is correct with respect to a relational database?
(1) Any subset of Alternate Keys is called Candidate Key.
(2) A Primary Key is selected from Alternate Keys.
(3) A Foreign Key is an Alternate Key.
(4) Always Primary Key and Foreign Key are combined to create a Compound Key.
(5) Primary Key and Foreign Key establish the relationship between two tables.

| | |
|---|---|
| Primary Key | • Uniquely identify all table records , not null<br>• A table **can** be created without the primary key |
| Foreign Key | • Link two tables together<br>• Refers to the primary key of a different table<br>• A foreign key can contain duplicate values |
| Alternate Key | • The key that has not been selected to be the primary key, but are candidate keys<br>• If a table consists of only one candidate key then it becomes the primary key. Then there will be no alternate key |
| Compound Key | • A combination of two or more columns in a table that can be used to uniquely identify each row in the table (can be a primary key) |
| Candidate Key | • 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)<br>• Each table may have one or more candidate keys but one primary key |

| | | |
|---|---|---|
| Answer (1) | Incorrect | Alternate keys are subset of candidate keys |
| Answer (2) | Incorrect | Primary key is not an alternate key |
| Answer (3) | Incorrect | A foreign key is not an alternate key. It is a primary key of a different key |
| Answer (4) | Incorrect | Not always |
| Answer (5) | Correct | |

28. Consider the following data flow diagram:




In the above data flow diagram A, B3 and C2 represent ..... respectively.
Which of the following terms is the most appropriate to fill the blank?

(1) a process, an external entity and a data store
(2) an external entity, a process and a data store
(3) an external entity, a data store and a process
(4) a data store, a process and an external entity
(5) a data store, an external entity and a process

| | |
|---|---|
| A | External Entity |
| B1 | Process ID |
| B2 | Person who operates the process / the location where the operation takes place |
| B3 | Name of the process |
| C1 | States whether the data store is manual, digital or temporary |
| C2 | Name of the data store |

29. Consider the following systems in a human body:

A - respiratory system
B - digestive system
C - nervous system
D - blood circulatory system

Which of the above are closed systems?

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

| Open System | Closed System |
|---|---|
| • Interacts with its environment through giving and receiving data/ information/ material/ energy<br>• Inputs are taken from the system environment and outputs are given to the environment as well | • All interaction and knowledge is transmitted within the closed system only<br>• Inputs are taken within the system boundary and outputs are given within the system boundary as well |

| | |
|---|---|
| A - Respiratory system | An Open system |
| B - Digestive system | An Open system |
| C - Nervous system | A Closed system |
| D - Blood circulatory system | A Closed system |

30. Which of the following statements best describes a non functional requirement of a system?
(1) A user shall be able to measure the blood pressure using an electronic blood pressure meter.
(2) A microwave oven should not exceed its temperature above 400° C.
(3) An electronic calculator should be able to compute square root of a given positive integer.
(4) An Automatic Teller Machine of a bank shall be able to check the validity of an ATM card.
(5) An internet banking system shall provide balance inquiry facility to its customers.

| 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 |

| | |
|---|---|
| Answer (1) | A functional requirement |
| Answer (2) | A non-functional requirement |
| Answer (3) | A functional requirement |
| Answer (4) | A functional requirement |
| Answer (5) | A functional requirement |

31. Which of the following statements is true with regard to data and information?
(1) Decision can be made only when a massive volume of data is available.
(2) Validity of information depends on the accuracy of data.
(3) Information obtained by processing data is always accurate.
(4) In order to obtain information, data must be collected from multiple sources.
(5) The accuracy of information depends only on the accuracy of input data.

**Characteristics of data and information**

| Data | Information |
|---|---|
| Just raw facts (unorganized) | Data organized in a meaningful way |

**Characteristics of a quality Information**
- Relevance/ appropriateness
- Accuracy
- Level of detail/conciseness
- Reliability or objectivity
- Availability/accessibility
- Timing

| | | |
|---|---|---|
| Answer(1) | Incorrect | Making decisions **does not depend** on the **volume of the data** |
| Answer(2) | Correct | |
| Answer(3) | Incorrect | We **cannot say that** we **can always** obtain accurate information by processing data. |
| Answer(4) | Incorrect | We can obtain information by processing data we got only from one source |
| Answer(5) | Incorrect | The accuracy **does not only depend** on accurate data. It may depend on the processing as well |

32. Consider the following techniques :

A - Computer Aided Learning (CAL)
B - Computer Based Learning (CBL)
C - Computer Based Assessment (CBA)

Which of the above techniques is/are used in ICT based Teaching and Learning?

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

| | |
|---|---|
| A - Computer Aided Learning (CAL) | Refers to an educational setting where a computer software is being used to help the user to study a certain subject |
| B - Computer Based Learning (CBL) | Refers to any kind of learning with the help of computers |
| C - Computer Based Assessment (CBA) | Refers to a computer-based test that is both given and graded (by the computer) |

33. The generation of monthly salary slips of employees in an organization is an example for

(1) Batch processing. (2) Real time processing. (3) Online processing.
(4) Transaction processing. (5) Interactive processing.

| | Definition | Examples |
|---|---|---|
| (1) Batch processing | The method computers use to periodically complete high-volume, repetitive data jobs | Credit card companies sending one bill per month stating each and every transaction |
| (2) Real time processing | The data have to be processed within a small time period | ATMs transactions |
| (3) Online processing | The ongoing entry of transactions into a computer system in real time | Bar code scanning |
| (4) Transaction processing | Is information processing that is divided into individual, indivisible operations called transactions | Online bill payments, Self-checkout stations at grocery stores, the trading of stocks over the internet |
| (5) Interactive processing | Means that the person needs to provide the computer with instructions whilst it is doing the processing | ATM |

34. Consider the following statements about Firmware :

A - Firmware is the program required to bootup a computer system.
B - Firmware is incorporated in washing machines.
C - Firmware can be easily changed later on.

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) B and C only

**Firmware**

- A software program or set of instructions programmed on a hardware device.
- A firmware which resides in ROM **cannot easily** be updated

Examples:

- The booting instructions stored in ROM
- Code inside a printer (in addition to the printer driver that is in the computer)

35. Consider the following components:

A - Web authoring tool
B - Domain name
C - Web pages
D - Web server

Which of the above components are essential for hosting a web site?

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

| | Explanation | Why is it essential? Or not essential? |
|---|---|---|
| A - Web authoring tool | Web content can be created with web authoring tools. We can either download them to our computer or access them online. | Web hosting does not include creating the website. |
| B - Domain name | Is the name which users can access our website through the Internet | Without a domain name, a website is inaccessible |
| C - Web pages | Part of a website. A website may contain several web pages | A website always have even a one web page |
| D - Web server | Display the web content of the websites which resides in the web server according to the client's requests | A website in inaccessible through Internet to the clients if it is not in a web server |
| Hosting a website | The procedure in which a web hosting company stores and maintains website files and applications on a server to make its clients' webpages reachable online | |

36. Which of the following tag is used to render a heading on an HTML page?
(1) <h2> (2) <ol> (3) <ul> (4) <hr> (5) <td>

| Tag | Stands for.. |
|---|---|
| (1) <h2> | heading 2 |
| (2) <ol> | ordered list |
| (3) <ul> | unordered list |
| (4) <hr> | horizontal line |
| (5) <td> | table data |

37. Which of the following could be used to define a new markup language for sharing information?
(1) CSS (2) XML (3) HTML (4) XHTML (5) JavaScript

| | |
|---|---|
| (1) CSS | A language we use to style an HTML document |
| (2) XML | A metalanguage which allows users to define their own customized markup languages |
| (3) HTML | The standard markup language which we can use to create a website |
| (4) XHTML | Stands for EXtensible Hyper Text Markup Language. Stricter than HTML |
| (5) JavaScript | Programming language of the web which allows us to create dynamic web contents |

38. Consider the following HTML code segment:

```
<dl>
<dt>Teacher</dt>
<dd>A person who teaches in a school.</dd>
<dt>Student</dt>
<dd>A person who is studying at a school</dd>
</dl>
```

In definition list, the data entered after the title will appear with an indentation after the title (No ":" / "-")

Which of the following shows the correct rendering of the above HTML code segment?

(1)
Teacher
A person who teaches in a school.
Student
A person who is studying at a school

(2)
Teacher
- A person who teaches in a school.
Student
- A person who is studying at a school

(3)
Teacher
: A person who teaches in a school.
Student
: A person who is studying at a school

(4)
Teacher
: A person who teaches in a school.
Student
: A person who is studying at a school

(5)
Teacher
- A person who teaches in a school.
Student
- A person who is studying at a school

39. Which of the following statements is correct with regard to HTML tags?
(1) The <br> is used to render a blank line before and after the text.
(2) The <p> is used to render a blank line before and after the text.
(3) The <br> is used to render a blank line before the text.
(4) The <p> is used to render a blank line only before the text.
(5) The <p> is used to render a blank line only after the text.

| | |
|---|---|
| <br> tag (break) | Render a blank line only after the text |
| <p> tag (paragraph) | Render a blank line before and after the text |

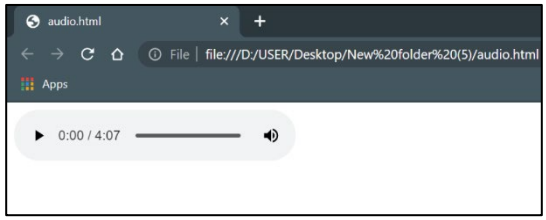
40. Consider the following HTML code segments:
A - <embed height="50" width="100" src="song.mp3"></embed>
B - <a href="song.mp3">Song</a>
C - <embed height="50" width="100" href="song.mp3"></embed>
Which of the above code fragment(s) can be used to embed the audio file named 'song.mp3' in a web page?
(1) A only (2) B only (3) C only (4) A and B only (5) B and C only

| | | |
|---|---|---|
| Statement A | Correct | |
| Statement B | Correct | |
| Statement C | Incorrect | The audio file name have to be " src= 'song.mp3' " Using href instead of src is incorrect |

**Another way of adding an audio file to the webpage**

```
<html>
<body>
<audio controls src="Westlife - Evergreen.mp3">

</body>
</html>
```



41. What is the main function of a PROXY server in Internet communication?
(1) Allocate and release IP addresses
(2) Translate domain names to IP addresses
(3) Protect a network from viruses
(4) Provide printing services to users
(5) Share an Internet connection among several computers

**Proxy server**

❖ A server that acts as an intermediary for requests from clients seeking resources from other servers.

*Requirement of proxy server*:

- To control internet usage of employees and children
- Bandwidth savings and improves speed
- Privacy benefits
- Improved security

| | |
|---|---|
| (1) Allocate and release IP addresses | Function of a DHCP server |
| (2) Translate domain name to IP addresses | Function of a DNS Server |
| (3) Protect a network from viruses | Function of a firewall device |
| (4) Provide printing services to users | Function of a printer |
| (5) Share an Internet connection among several computers | Function of a router. A proxy server also perform this function by providing a gateway between users and the Internet |

42. An organization has been allocated a Class C IP address range having a subnet mask of 255.255.255.0. If the organization is to setup a web server and an email server, what are the IP addresses that can be allocated to these two servers?
(1) 192.248.87.2, 192.248.32.3
(2) 192.248.87.4, 192.248.87.5
(3) 192.248.32.3, 192.248.33.3
(4) 192.248.40.2, 192.248.41.3
(5) 192.248.87.1, 192.248.60.2

As the subnet mask is 255.255.255.0, only the last octet can be changed (First three octets have to be the same)

| | | |
|---|---|---|
| Answer (1) | Incorrect | Third octet is different in both IP addresses |
| Answer (2) | Correct | |
| Answer (3) | Incorrect | Third octet is different in both IP addresses |
| Answer (4) | Incorrect | Third octet is different in both IP addresses |
| Answer (5) | Incorrect | Third octet is different in both IP addresses |

43. In communication networks, ISDN stands for
(1) Integrated Service Domain Name.
(2) Internet Service Directory Name.
(3) Integrated Service Digital Network.
(4) Internet Service Digital Network.
(5) Integrated Service Domain Network.

44. In the OSI reference model, detection of errors during communication between two computers in a network is a function of the .....
(1) physical layer.
(2) data link layer.
(3) network layer.
(4) transport layer.
(5) application layer.

| 7 layers of OSI reference model (Bottom to Top) | | |
|---|---|---|
| Layer | Explanation | Names for the data units at each layer |
| 1st layer – Physical layer | It provides a physical medium through which bits are transmitted | Bits |
| 2nd layer – Data link layer | It is used for error free transfer of data frames | Frames |
| 3rd layer – Network layer | It is responsible for moving the packets from source to destination | Packets / Datagrams |
| 4th layer - Transport layer | It provides reliable message delivery from process to process | Segments |
| 5th layer – Session layer | It is used to establish, manage and terminate the sessions | Data |
| 6th layer – Presentation layer | It is responsible for translation, compression and encryption | Data |
| 7th layer – Application layer | It provides the services to the user | Data |

45. The command that can be used to login to a remote computer through a network is
(1) ipconfig. (2) ftp. (3) telnet. (4) tracert. (5) route.

| | |
|---|---|
| (1) ipconfig | Displays all current TCP/IP network configuration values and refreshes DHCP and DNS settings |
| (2) ftp | Is used for file transfers between one system and another |
| (3) telnet | Is a client/ server application protocol that provides access to virtual terminals of remote systems on local area networks or the Internet |
| (4) tracert | Is useful for troubleshooting large networks where several paths can lead to the same point or where many intermediate components (routers or bridges) are involved |
| (5) route | Distinguishes between routes to hosts and routes to networks by interpreting the network address of the destination variable |

46. Which of the following devices can be used to connect two physical networks having IP addresses 72.110.0.0 (subnet mask 255.255.0.0) and 192.248.10.0 (subnet mask 255.255.255.0)?
(1) Hub (2) Repeater (3) Switch (4) Router (5) Multiplexer

| Class | IP address range (1st Octet) | Network mask |
|---|---|---|
| A | 0 - 127 | 255.0.0.0 |
| B | 128 – 191 | 255.255.0.0 |
| C | 192 - 223 | 255.255.255.0 |

IP address 72.110.0.0 and IP address 192.248.10.0 belongs to two different subnets
Therefore, these two subnetworks can be connected using a router

47. Consider the following statements regarding relational databases:

A - Changing the column order of relations in a database structure does not necessarily require changes in application programs.

B - Main objective of normalization of databases is to reduce data redundancy.

C - Adding new data to the database always requires changes to the existing programs.

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

| | | |
|---|---|---|
| Statement A | Correct | |
| Statement B | Correct | |
| Statement C | Incorrect | We can add data to a table using INSERT. That does not change existing programs |

48. Ubiquitous Computing is a/an ..... computing environment. The user will be able to use both ..... and ..... services.

Which of the following is most appropriate to fill the blanks in the above statement?

(1) everywhere, mobile, local (2) everywhere, local, remote (3) everywhere, local, paid

(4) virtual, local, remote (5) virtual, mobile, global

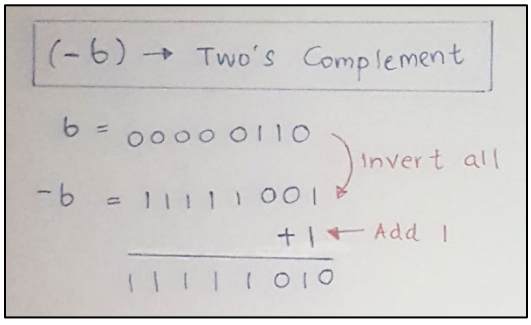
*Ubiquitous Computing* - is a concept where computing is **made to appear anytime** and **everywhere**.

49. What is the two's complement of $-6_{10}$?

(1) 11111010 (2) 00000110 (3) 11111001 (4) 01011111 (5) 00000101

Two's Complement (when a negative number is given)

- Convert the positive decimal number of the given negative number to binary
- Invert all and add 1



50. Consider the following two relations:

student(stdNo, name)

courseMarks(courseId, stdNo, marks)

Which of the following SQL (Structured Query Language) statements on the above relations is syntactically correct?

(1) select stdNo, marks from student, courseMarks

(2) select * from student and courseMarks

(3) select s.stdNo and c.marks from student s, courseMarks c

(4) select student.stdNo, courseMarks.marks from student, courseMarks
where student.stdNo = courseMarks.stdNo

(5) select student.stdNo and courseMarks.marks from student and courseMarks
where student.stdNo := courseMarks.stdNo

| | | |
|---|---|---|
| Answer(1) | Incorrect | As stdNo is being used as the foreign key in courseMarks table, we have to say from which table we are going to select the attribute |
| Answer(2) | Incorrect | When mentioning the two tables there have to be a comma in between them. Can't use 'and' |
| Answer(3) | Incorrect | Incorrect way of stating the table of attributes which we want to select |
| Answer(4) | Correct | |
| Answer(5) | Incorrect | When we are writing multiple attributes to select, have to use ',' in between the attributes. |