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Provincial Department of Education - NWP

තෙවන වාර පරීක්ෂණය - 13 ශ්‍රේණිය - 2023
Third Term Test - Grade 13 - 2023

20 S I

Index No.: .....

Information And Communication Technology- I

02 hours

Instructions:

- **Answer all the questions.**
- **Write your Index Number in the space provided in the answer sheet.**
- **Read and follow the given instructions carefully.**
- **In each of the questions 1 to 50, pick one of the alternatives from (1), (2), (3), (4), (5) which is correct or most appropriate.**

1. Which of the following statements is correct?
   (1) Digital dividing is always between school-going and non-school-going students.
   (2) Unauthorized copying, distribution, and use of software is called phishing.
   (3) Plagiarism can be prevented by setting up firewalls, using passwords, not opening suspicious e-mails, and not clicking on suspicious links.
   (4) Use and sale of any new creations for other creations without the permission of the creator is an offense punishable under the Intellectual Property Laws.
   (5) Citing, Quoting and Referencing may prevent software plagiarism

2. A student applies for rescrutiny of his examination results through the examination department website. In order to complete the application form correctly, it is mandatory to enter the year that appeared on the examination and index number and an integer number should be entered for the index number.

   Select the data validation method/methods used in this scenario.

   A - Data type check B - Presence check C - Range check
   (1) A only (2) B only (3) A and B only
   (4) A and C only (5) B and C only

3. Which of the following gives the correct result of bit-wise AND and bit-wise OR operations between the two binary numbers 10101111_2 and 01010101_2 respectively in decimal form?
   (1) 175, 85 (2) 5, 255 (3) 255, 5 (4) 175, 255 (5) 85, 5

4. What is the correct binary equivalent of decimal 6.75_{10} ?
   (1) 110.00_2 (2) 101.11_2 (3) 1100.10_2 (4) 110.11_2 (5) 110.01_2

5. What is the correct 2's complement binary representation of decimal -45_{10} using 8-bits?
   (1) 00101101_2 (2) 11010011_2 (3) 11010010_2 (4) 00110010_2 (5) 00110011_2

6. A memory address is shown as hexadecimal 1AF. What would that address be in decimal form?
   (1) 207 (2) 413 (3) 431 (4) 4001 (5) 4131

7. A particular command can be used to convert the text in a text file to its binary format.
Assume a file contains the following text :

List1

Considering the **Important notes** given below, select the correct output that will result when the said command is run on that file.

(1) 1001100 1101001 1110011 1110100 0110001 0001010
(2) 1001101 1101010 1110100 1110101 0110111 0001010
(3) 1001011 1101000 1110010 1110011 0110011 0001010
(4) 1001011 1101000 1110011 1110100 1110001 0001010
(5) 1001100 1101000 1110011 1110101 0111001 0001010

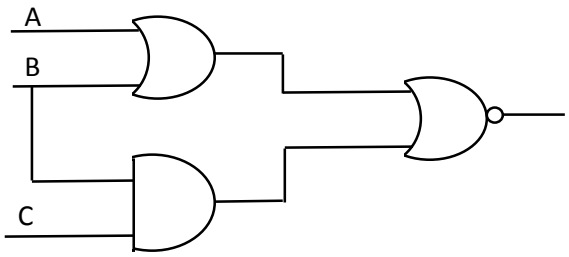
Important notes:

(i) The file ends with a Line Feed character.
(ii) Some selected rows from the 7-bit ASCII table are given below:

Character	**Binary**
Line Feed	0001010
Space	0100000
s	1110011
t	1110100
l	1101100
i	1101001
t	1110100

Character	**Binary**
1	0110001
S	1010011
T	1010100
L	1001100
I	1001001

8. Consider the following logic circuit:



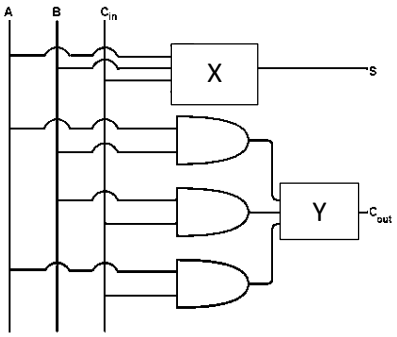
Which of the following Boolean expressions represents the output of the given logic circuit?

(1) $(\overline{A+B})+\overline{BC}$ (2) $(\overline{A+B})\,\overline{BC}$ (3) $\overline{(\overline{A+B})+\overline{BC}}$
(4) $(\overline{AB})+(\overline{B+C})$ (5) $\overline{AB+BC}$

9. Simplified Boolean expressions help to obtain simpler circuits.
Which of the following is a simplified form of $\overline{AB}\ (\bar{A}+B)(\bar{B}+B)$?

(1) $\bar{A}$ (2) $\bar{B}$ (3) A (4) B (5) $\overline{AB}$

10. Below is a circuit diagram representing the Full adder. What are the correct logic gates for X and Y respectively?



(1) OR, XOR (2) XOR, XNOR (3) NAND,NOR
(4) XOR,OR (5) NOR,XNOR

11. Linking an address in a physical memory frame corresponding to an address in a virtual memory page is called .....①.....
.....②..... is a storage mechanism used in the Operating system to retrieve processes from secondary storage to the main memory as pages.
.....③..... is caused by empty spaces created in places where processes are given to memory and then removed from memory when they are finished.

Choose the most appropriate words to fill in the blanks in the above statements.

(1) ①⟶ Swapping, ②⟶ Mpping, ③⟶ Paging
(2) ①⟶ Mpping , ②⟶ Paging , ③⟶ Fragmentation
(3) ①⟶ Fragmentation , ②⟶ Mpping , ③⟶ Paging
(4) ①⟶ Mpping, ②⟶ Swapping , ③⟶ Compaction
(5) ①⟶ Paging, ②⟶Compaction, ③⟶ Fragmentation

12. Select statement/s with functions performed by the memory management unit,
A - Holds details of memory resources.
B - Converts a physical memory address to a logical memory address.
C- Allocates memory optimally among programs.

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

13. What tasks does the operating system **not perform** in terms of computer memory management?
(1) In multiprogramming, the operating system decides which process should be sent to main memory at what time, and how much memory capacity is allocated to each operation.
(2) Allocating memory when a process needs it.
(3) De-allocates the memory when a process no longer needs it or has been terminated.
(4) Keeping track of what parts of memory have been allocated by processes and what parts have not yet been used.
(5) In a multi-program environment, deciding which process should be given to the processor at what time, and for how long.

14. Which of the following protocols is/are **not used** in the Internet layer protocols of the TCP/IP model?
A - User Datagram Protocol (UDP)
B - File Transfer Protocol (FTP)
C - Internet Protocol (IP)

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

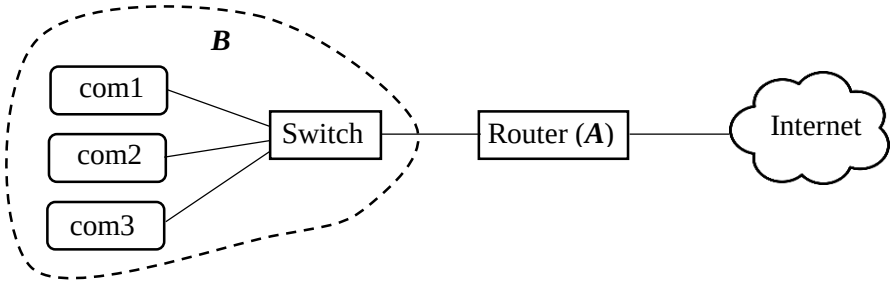
15. Which of the following statements is/are correct about MAC and IP addresses?
A - A MAC address is 48 bits long and is used at the data link layer.
B - An IPv6 address is 128 bits long and is used at the network layer.
C - An IPv4 address is 32 bits long and a MAC address is 48 bits long and both of these addresses are used at the network layer.

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

16. An organization with the assigned IP address block 200.2.2.0/25 needs to create 4 subnets. Each subnet should provide for more than 20 IP addresses. Which of the following correctly lists, the number of bits needed to identify the **given network**, the total number of bits needed to create subnets, and the number of bits needed to assign a unique IP address for this requirement?

(1) 24, 2, 5 (2) 24, 3, 5 (3) 25, 2, 5 (4) 25, 3, 5 (5) 27, 2, 5

17.



According to the above network diagram, computer network ***B*** is connected to the Internet through router ***A***. Computers com1, com2, com3, are connected in network ***B***.
According to this network diagram and description, Which option is most suitable to fill in the blank spaces Ⓟ,Ⓠ and Ⓡ respectively?
Network ***B*** has several computers connected to the switch and those computers are assigned private IP addresses. The default gateway of router ***A*** receives a .....Ⓟ..... IP address, and the .....Ⓠ..... provides private IP addresses through the .....Ⓡ..... protocol to each computer on network ***B*** that is connected to that router over the data transmission medium.

(1) Ⓟ- private , Ⓠ - internet , Ⓡ - HTTP
(2) Ⓟ- private , Ⓠ - router , Ⓡ - FTP
(3) Ⓟ- private , Ⓠ - router , Ⓡ - DHCP
(4) Ⓟ- public , Ⓠ - router , Ⓡ - DNS
(5) Ⓟ- private , Ⓠ - file server , Ⓡ - DNS

18. Which of the following is correct about unguided media used in data transmission?
A - Signals are transmitted through the atmosphere.
B - Optical fiber is the fastest unguided medium.
C - Transmission in guided media is more secure than transmission in unguided media.
D - Unguided media transmission can achieve higher data transmission speed than guided media transmission.

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

19. Which of the following is false regarding ring topology and bus topology?
A - In the ring topology, all data travels clockwise only.
B - Each node in the bus topology is directly connected to only two adjacent nodes.
C - A linear cable is used to connect all the nodes in the bus topology.

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

20. Match each data communication protocol given from P to T to the corresponding layers of the OSI reference model, labeled 1 to 5.

Protocols	Layers of OSI
P - UDP	1 - Application layer
Q - HTPPS	2 - Physical layer
R - IP/RIP	3 - Transport layer
S - Ethernet	4 - Network layer
T - MAC	5 - Data link layer

(1) P – 3, Q – 1, R – 4, S – 3, T – 2 (2) P – 3, Q – 2, R – 1, S – 4, T – 5
(3) P – 2, Q – 3, R – 5, S – 1, T – 4 (4) P – 3, Q – 1, R – 4, S – 2, T – 5
(5) P – 1, Q – 2, R – 3, S – 4, T – 5

21. A message sent from **A** to **B** over the network is converted to a secret code using a software key before sending it to **B**. Then **B** converts it to a state readable again by another logically compatible software key. Which of the following is correct regarding the above situation?

(1) **A** uses a digital signature to secure the message sent by **A** to **B**.
(2) Symmetric key encryption is used in the above process.
(3) The message sent by **A** in the ASCII code system is converted to the Unicode system by **B**.
(4) **A** encrypts by using the public key and **B** decrypts it using the public key.
(5) Asymmetric key encryption is used in the above process.

22. Choose the correct statement/s from the following statements about feasibility studies,

A - A cost-benefit study is conducted during economic feasibility to evaluate whether the benefits in system development justify the investment.
B - Operational feasibility determines whether the proposed system will support the organization's strategic objectives.
C- Organizational feasibility evaluates the willingness and ability of the users to support and use the proposed system.

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

23. A System Analyst analyses three manual information systems P, Q, and R to be automated and presents the following report:

System A : Requirements are clear and stable and do not allow for changes throughout the project.
System B : There is a medium to high level of risk and significant changes are expected in the system development process.
System C : The system requirements are not complex and modules are developed in parallel because the new system must be created in a short period of time

Which of the following system development models is best for A, B, and C respectively?

(1) A⟶ Agile, B ⟶ Spiral, C ⟶ Waterfall
(2) A⟶ Spiral , B ⟶ Waterfall, C ⟶ Rapid Application Development
(3) A⟶ Rapid Application Development, B ⟶ Agile, C ⟶ Spiral
(4) A⟶ Agile, B ⟶ Rapid Application Development, C ⟶ Spiral
(5) A⟶ Waterfall, B ⟶ Spiral, C ⟶ Rapid Application Development

24. Choose the **false** statement from the following statements about Acceptance testing.

(1) Acceptance testing is performed before the system is accepted by the client.
(2) System testing is done after acceptance testing.
(3) Internal acceptance testing is also known as alpha testing.
(4) Customer acceptance testing is performed by the organization that developed the software.
(5) User acceptance testing is performed by the client's customers.

25. Which of the following statements best describes a non-functional requirement of a system?

(1) Customers should be allowed to transfer money from their accounts to other accounts through the online banking system.
(2) An e-commerce website must be able to verify the identity of users after entering a username and password.
(3) Even if a school management system crashes, its data should be secure.
(4) In a library management system users should be able to search for books based on book name, serial number, or publisher name.
(5) Students should be given the opportunity to access learning resources through a learning management system.

26. According to the rules of data flow modeling which is the correct statement regarding data flows in cases A, B, C and D?

A - Between two external entities
B - Between two processes
C - Between an external entity and a database
D - Between two databases

(1) A,B ⟶ Direct data flows can exist C,D ⟶ Direct data flows can't exist
(2) A,C ⟶ Direct data flows can exist B,D ⟶ Direct data flows can't exist
(3) B,C ⟶ Direct data flows can exist A,D ⟶ Direct data flows can't exist
(4) C,D ⟶ Direct data flows can exist A,B ⟶ Direct data flows can't exist
(5) B,D ⟶ Direct data flows can exist A,C ⟶ Direct data flows can't exist

27. Consider the information system types in List A and the examples given in List B. Identify the most suitable matching between the items in lists A and B.

List A

A1 - Transaction Proccesing System

A2 - Decision Support System

A3 - Expert System

List B

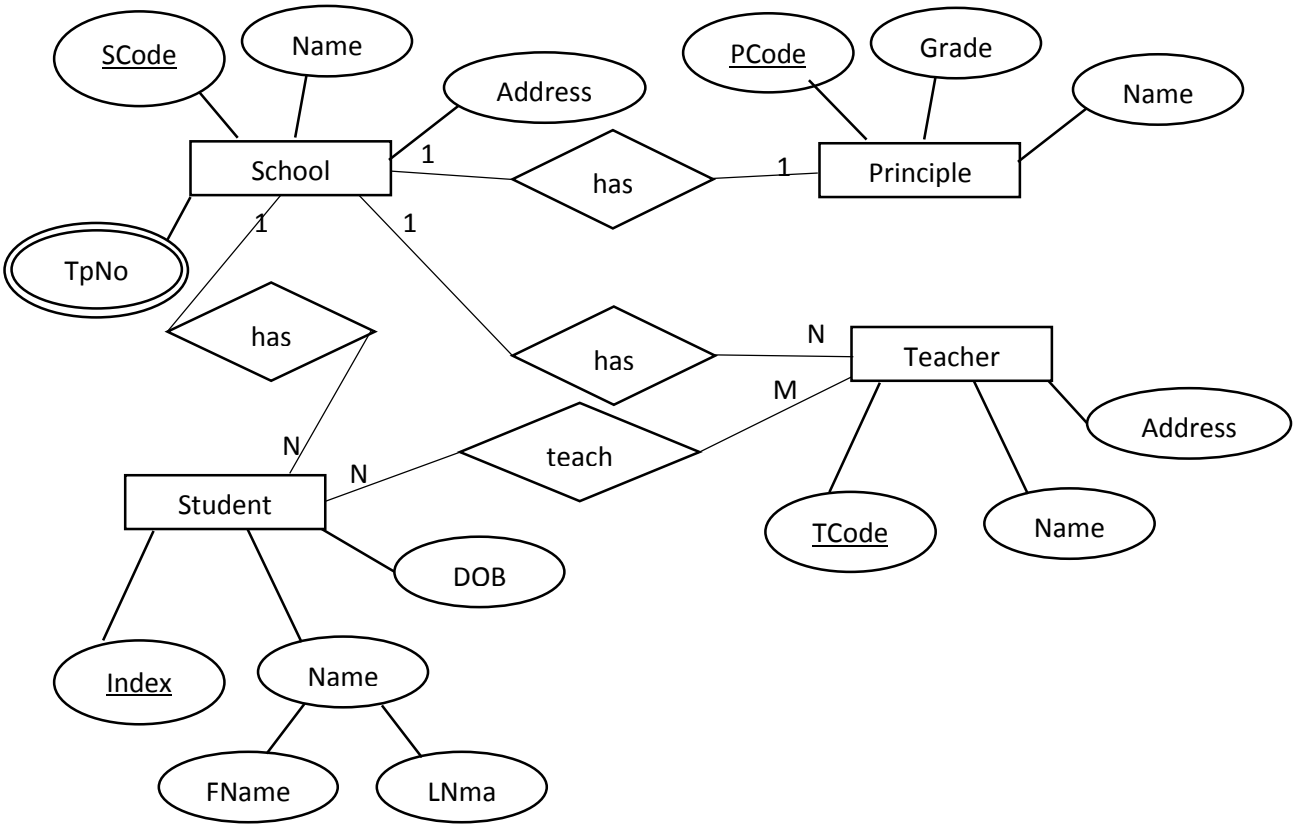
B1 - A system that analyzes traffic data and route information and provides the best route between locations.

B2 - A lung cancer detection system using artificial intelligence and knowledge database.

B3 - An online flight booking system.

(1) A1-B1, A2-B2, A3-B3 (2) A1-B2, A2-B3, A3-B1 (3) A1-B3, A2-B1, A3-B2
(4) A1-B2, A2-B1, A3-B3 (5) A1-B3, A2-B2, A3-B1

Question numbers 28 to 31 are based on the following ER diagram



28. What is the correct relational schema for the above ER diagram?

(1) ***School*** (SCode, Name, Address, TpNo), ***Principle*** (PCode, Grade, Name, SCode)
Teacher (TCode, Address, Name, SCode, Index),
Student (Index, FName, LName, DOB, SCode)

(2) ***School*** (SCode, Name, Address), ***Principle*** (PCode, Grade, Name, SCode) ,
Teacher (TCode, Address, Name, SCode), ***Student*** (Index, FName, LName, DOB, SCode),
School_phone (SCode, TpNo), ***teach*** (TCode, Index)

(3) ***School*** (SCode, Name, Address), ***Principle*** (PCode, Grade, Name, SCode) ,
Teacher (TCode, Address, Name, SCode), ***Student*** (Index, Name, DOB, SCode)
School_phone (SCode, TpNo), ***teach*** (TCode, Index)

(4) ***School*** (SCode, Name, Address), ***Principle*** (PCode, Grade, Name, SCode),
Teacher (TCode, Address, Name, SCode), ***Student*** (Index, FName, LName, DOB, SCode),
School_phone (SCode, TpNo)

(5) ***School*** (SCode, Name, Address), ***Principle*** (PCode, Grade, Name, SCode),
Teacher (TCode, Address, Name, SCode), ***Student*** (Index, DOB, SCode),
School_phone (SCode, Tpo), ***Student_Name*** (FName, LName)

29. Assume that the above relationships are converted to database tables. What should be the output of the following SQL query?

UPDATE Student SET Name="Kamal Bandara" WHERE Name="Kamal";

(1) The name Kamal Bandara in the Student table is replaced with Kamal.
(2) All data in the Name fields of the Student table will be replaced with Kamal Bandara.
(3) Only one recorde is affected by this command at a time.
(4) In the name field of the Student table, all data containing Kamal will be replaced with Kamal Bandara.
(5) This command does not work correctly.

30. What is the correct SQL command to output all the data of the student with index number S001 along with the name of the school he is studying in?

(1) SELECT * FROM Student where Index= "S001";
(2) SELECT S.Indxe,Name,DOB,C.Name FROM Student,School WHERE S.SCode=C.SCode AND S.Index= "S001";
(3) SELECT Student.Indxe,Name,DOB,School.Name FROM Student,School WHERE Student.SCode =School.SCode AND Student.Index="S001";
(4) SELECT S.Indxe,Name,DOB,C.Name FROM Student,School WHERE S.SCode=C.SCode ;
(5) SELECT St.Indxe,FName,LName,DOB,Sc.Name FROM Student St,School Sc WHERE St.SCode=Sc.SCode AND St.Index= "S001";

31. Consider the following statements regarding the above *Principal* Entity.

A - It has a primary key constraint
B - It must have a foreign key constraint.
C - It has a domain constraint.

Which of the above statements is true?

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

32. Consider the following statements regarding normalization.

A - Value duplication cannot occur in a table existing in the first normalization
B - A table that exists in the second normalization may have transitive dependencies.
C - A table that exists in the third normalization may or may not have a composite key.

Which of the above statements is true?

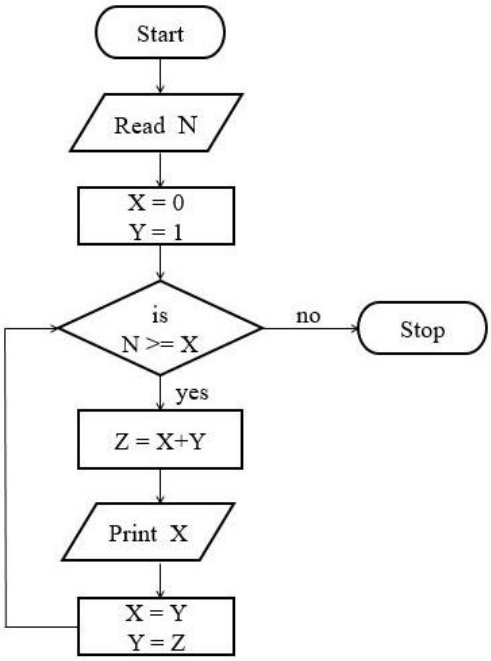
(1) A only (2) B only (3) A and B only
(4) B and C only (5) All A,B and C

33. Which of the following statements regarding EER-Diagrams is **false**?
    (1) Specialization is a process of separating an entity into several entities through specific attributes
    (2) Normalization is the process of reducing multiple entities to a single entity through common attributes.
    (3) Another method for defining attributes with multiple values is included in the EER diagrams.
    (4) Some components not included in ER diagram are included in EER diagram.
    (5) EER diagram provides better definition than ER diagram in very complex data based design.

34. A command contained in the Data Manipulating Language (DML) is,
    (1) ALTER (2) CREATE (3) SHOW (4) DROP (5) SELECT

35. Consider the following statements regarding database relational schema.
    A - It is a diagram that maps a conceptual database to a logical database.
    B - All constraints applied to data are defined in the logical schema.
    C - The data and information that can exist in a record is represented through this
    Which of the above statements is true?
    (1) A only (2) B only (3) A and B only
    (4) A and C only (5) All A,B and C

36. Which of the following statement/s is/are correct regarding the algorithm expressed in the given flowchart?
    A - Input is taken only once from the user.
    B - The output is always the sum of the previous two numbers.
    C - When the input is 3 the number of repetitions is 05.
    (1) A only (2) B only (3) C only
    (4) A and B only (5) A and C only



37. What would be the output of the following Python code if the input is 20 ?

```
x = int(input( ))
x = (~x + 2 | 4)
print(x)
```

    (1) 13 (2) -13 (3) 19 (4) -19 (5) 23

38. What would be the output of the following Python code?

```
def st_list(student):
    for x in student:
        print(x)
students = ['Tom','Rex','Jerry','Xara']
st_list(students)
```

    (1) Tom,Rex,Jerry,Xara (2) Rex, Xara (3) 'Tom', 'Rex', 'Jerry', 'Xara'
    (4) Tom
    Rex
    Jerry
    Xara
    (5) Rex
    Xara

39. What would be the output of the following Python code?

```
for x in [1,3,5,7]:
    print(x)
```

(1) 1357 (2) 1 3 5 7 (3) 1 9 25 49 (4) 192549 (5) 1:1,3:9,5:25,7:49

40. What would be the output of the following Python code?

```
example = 'Snow World'
example[3] = 's'
print(example)
```

(1) Snow World (2) 'Snow World' (3) Snos World
(4) Snsw World (5) An error

41. How many times will the "*" symbol be output in the following Python code?

```
for x in [0,1,2]:
    for y in [0,1]:
        print('*')
```

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

42. What would be the output of the following Python code?

```
f = open('data.txt','w')
L = ['My\n','name\n','is\n','Xara']
f.writelines(L)
f.close()
f = open('data.txt','r')
print(len(f.readlines()))
```

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

43. What would be the output of the following Python code?

```
def mystery(str):
    out = ' '
    for char in str:
        if char = = 'i':
            break
        if char = = 'a':
            continue
        out += char
    return out

print(mystery('walking'))
```

(1) walking (2) wlking (3) wlk (4) wlkng (5) walkng

44. Which of the following HTML tags can be used to format a word in a text?
(1) <i>,<b>,,<sup> (2) <u>, <b>, <sub>, (3) <u>, <ol>, <sub>,
(4) , <br>, <tr>, (5) , <b>, <sub>,

45. What would be the output of the following HTML code segment?

```
<dl>
    <dt>Colours</dt>
    <ol><li>Red</li><li>Green</li></ol>
    <dt>Numbers</dt>
    <ol><li>one</li><li>two</li></ol>
</dl>
```

(1) Colours

i. Red
ii. Green

Numbers

i. one
ii. two

(2) Colours

- Red
- Green

Numbers

- one
- two

(3) Colours

1. Red
2. Green

Numbers

1. one
2. two

(4) Colours
Red
Green
Numbers
one
two

(5)
- Colours

Red
Green

- Numbers

one
two

46. Which of the following is the correct example for a Class selector of CSS?

(1) p{color:green; line-height:5px;}
(2) .para{color:green, line-height:5px;}
(3) #para{color:green; line-height:5px;}
(4) .para{color:green; line-height:5px;}
(5) $para{color:green; line-height:5px;}

47. What will be the output when the following PHP code is executed?

```
<html>
<body>
<?php
    $subject=array("english","Maths","Science");
    for($i=0;$i<3;$i++){
        echo $subject[$i]," ";}
?>
</body>
</html>
```

(1) english Maths Science

(2) englishMathsScience

(3) english
Maths
Science

(4) 0 english
1 Maths
2 Science

(5) 0 english1 Maths2 Science

48. Consider the following PHP code for inserting data into a table in a MySQL database.

```
$sql="INSERT INTO
user(telephone_no,amount_paid)values('$_POST[telephone_no]','$_POST[amount_paid]'
)";
if ($conn->query($sql)==TRUE){
echo"new record created";}
else{
echo "error:" .$conn->error;}
```

Which of the following statement are true about the above code?

A - It is possible to give data for the fields telephone_no and amount_paid in the data table..
B - The relevant data for $_POST[phone_no] and $_POST[paid_amount] will be entered through an HTML form.
C - "new record created" is the output of the web browser each time data is entered into the table.
D - Only the words telephone_no and amount_paid are inserted into the data table.

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

49. Which statement is true about the following code?

```
<style>
   #text1 { color:red;
            background- color: yellow;
           }
</style>
```

(1) It defines an inline style and uses the CSS 'group selector' concept.
(2) It defines an inline style and uses the CSS 'id selector' concept.
(3) It is an example of the CSS 'class' concept and the 'class selector' name is text1.
(4) It defines an internal style that uses the CSS 'id selector' concept.
(5) It defines an internal style that uses the CSS 'class selector' concept.

50. www.raabandporter.ca publishes sales of properties owned by the Government of Canada. In addition, advertisements related to the sale of properties of private property owners in different countries are also published on this website for a fee. What are the possible revenue models considered in publishing this website?
(1) Sales, Advertising
(2) Sales, Subscription
(3) Advertising, Subscription
(4) Affiliate marketing, Subscription
(5) Sales, Affileate markenting