General Certificate of Education (Adv. Level) Support Seminar - 2012

Sample Paper :- Information & Communication Technology I

Preparation   :- Ministry of Education

Instruction: Duration:- Two hours

- Answer all the questions.
- Use of calculators is not allowed.
- Instructions are given on the back of the answer sheet. Follow those carefully.
- In each of the question 1 to 50, pick one of the alternatives from (1), (2), (3), (4), (5) which is correct or most appropriate.

1. The first digital computer with a stored program is,
   (1) ENIAC   (2) EDVAC   (3) MARK 1
   (4) PASCALINE   (5) ANALYTICAL ENGINE

2. What is the technology used in third generation computers?
   (1) Vacuum tubes   (2) Transistors
   (3) Integrated circuits   (4) VLSI (Very Large Scale Integrated Circuits)
   (5) Micro processor

3. Which one of the followings complies with the 8 bit's 2's compliment?
   (1) 00001010   (2) 00001011   (3) 10001010
   (4) 11110101   (5) 11110110

4. Which of the following medical equipment uses radio waves?
   (1) CAT scanner   (2) MRI scanner   (3) CT scanner
   (4) X – Ray   (5) ECG

5. Which one of the followings represents the MSD and LSD of 0.025430 respectively?
   (1) 0 and 3   (2) 2 and 3   (3) 1 and 3
   (4) 3 and 1   (5) 3 and 0

6. $B12_{16} + 5CA_{16} =$
   (1) $10DC_{16}$ (2) FDC_{16} (3) $1F42_{16}$ (4) $0DC$ (5) $E1DC_{16}$

7. The hexadecimal equivalent of the octal number 35 is…,
   (1) 23_{16} (2) 27_{16} (3) 43_{16} (4) $A1_{16}$ (5) $1D_{16}$

8. Consider the following statements.
   A – Monotype waves travel in a baseband communication channel.
   B – Various types of waves travel in a broadband communication channel.
   C – Frequency is measured in bps (bits per second) in broadband.
   (1) A only.   (2) B only.   (3) A and B only.
   (4) A and C only.   (5) All A,B and C .

9. Which of the following data communication is used in frequency division multiplexing?
(1) Digital signal (2) Analog signal
(3) Digital and analog signal (4) Laser beam and Infrared beam
(5) Infrared beam and Bluetooth

10. An example of a Closed System is,
(1) Respiratory system (2) Digestive system (3) Blood Circulatory system
(4) A library system in a school (5) Refrigerator

11. Which of the following is a functional requirement of a bicycle when it is taken as a system?
(1) The cost for purchasing a bicycle.
(2) The comfortability of the bicycle seat.
(3) Proper functioning of the break
(4) Ability to use of bicycle in transportation.
(5) Finished appearance of the bicycle.

12. In which of the following test the user checks the accomplishment of user requirements in a information system?
(1) Unit test (2) Integrated test (3) System test
(4) Acceptance test (5) Black box test

13. What is the maximum number of host computers that can be connected to a network of IP address – 192.168.10.7 and a Subnet mask of 255.255.255.192?
(1) 32 (2) 62 (3) 64 (4) 126 (5) 128

14. Which of the following servers converts the web addresses into IP address?
(1) Web server (2) DNS Server (3) DHCP Server
(4) File server (5) FTP server

15. GPRS stands for,
(1) Global Ping Resource System (2) Global Packet Radio Station
(3) Global Ping Radio Service (4) General Packet Radio Service
(5) General Packet Radio Station

16. What is the output of "Python" statement 10*2**3%7?
(1) 1 (2) 2 (3) 3 (4) 10 (5) 60

17. Which of the following "Python" statement is acceptable?
A - a, b = 2+5, 2*5
B - X, Y = Y, X
C - X, Y = 5, 'Saman'

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

18. Select the output of the following "Python" program.

```
a = 3
def max (a,b):
        if  a>b:
                return a
        else:
                return b
print max (7,6),
print (a)
```

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

19. Which of the following "Python" data type is mutable?
    (1) Numbers   (2) Strings   (3) List
    (4) Tuple   (5) List and Tuple

20. Which of the followings consist iterable objects in "Python"?
    (1) List, Strings, Numbers   (2) List, Tuple, Numbers   (3) List, Strings, Set
    (4) Numbers, Strings, Sets   (5) Strings, List, Tuple

21. What is the output of the following "Python" statement respectively?
    >>>20%3   >>>20//3.0   >>>20/(9%5)
    (1) 2, 6, 5   (2) 2, 6.67, 20   (3) 2, 6.0, 5
    (4) 6, 6.0, 20   (5) 6, 6, 2

22. Consider the following python statement. Which of the following statement uses range function accurately?

    A -   >>>range (12)
    B -   >>>range (2,10,2)
    C -   >>>for i in range (1, 10):
              print (i)

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

23. Consider the given flow chart.
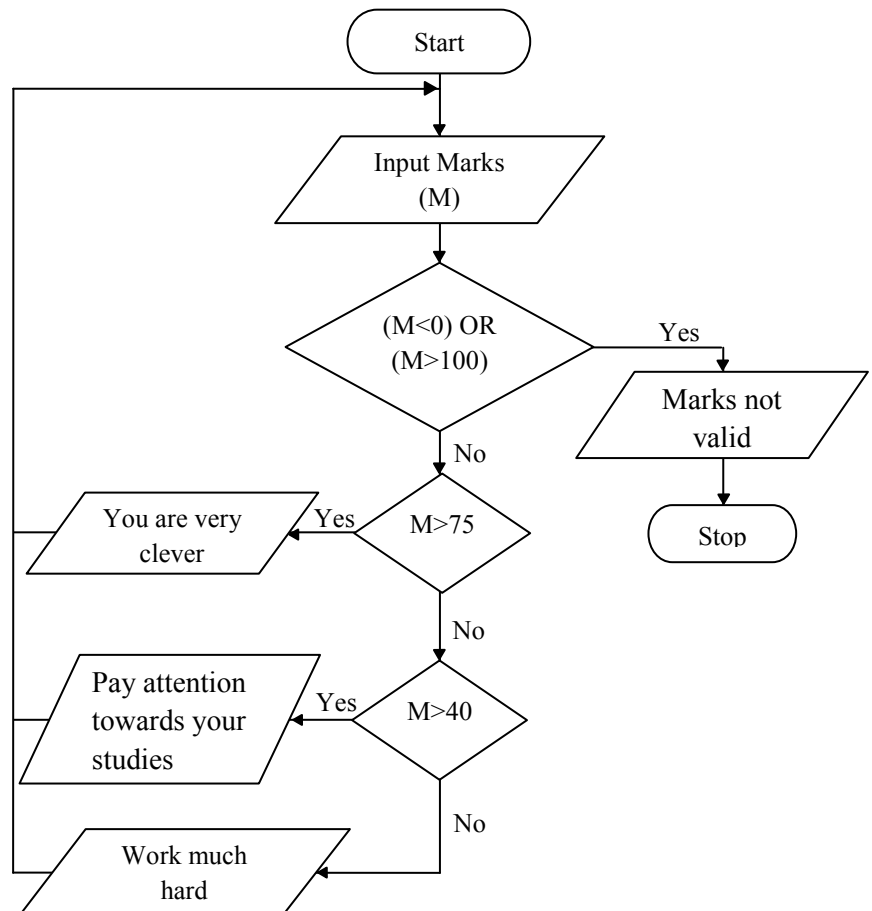
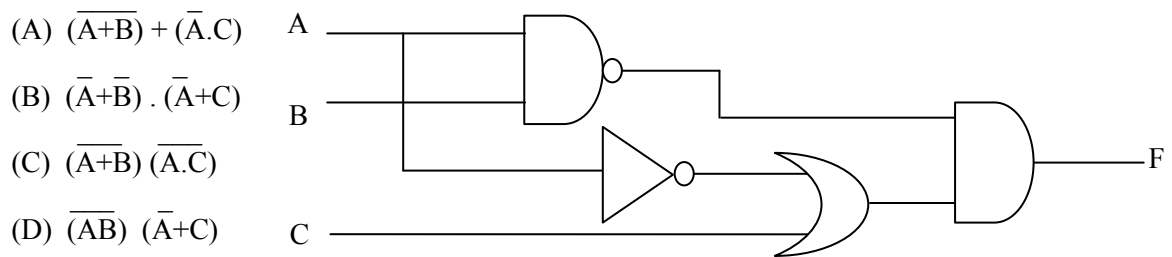   Which of the following statements about the algorithm represented by the flow chart is correct?
    (1) It stops when the user enters a minus value.
    (2) It displays the message "You are very clever" when the user enters 75.
    (3) It displays the message "Pay attention towards your studies" when the user enters 30.
    (4) It stops when the user enters the value 0.
    (5) It displays the message "Pay attention towards your studies" when the user enters 50.

24. What is the output of Boolean expression $F(X,Y) = \overline{\overline{X}.\overline{Y}} \, (\overline{X+Y})$ using demorgan theorem?
    (1) 0   (2) 1   (3) X   (4) Y   (5) X.Y

25. Which of the following Boolean expression corresponds with the logic circuit given?

    (A) $(\overline{A+B}) + (\overline{A}.C)$

    (B) $(\overline{A}+\overline{B}) . (\overline{A}+C)$

    (C) $(\overline{A+B}) \, (\overline{A.C})$

    (D) $\overline{(AB)} \, (\overline{A}+C)$

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

26. Select the correct SQL statement to output names of student above 15 years of age, grade and marks?
    (1) SELECT stuName, class, Subjectmarks
        FROM age>15
        WHERE Student
    (2) SELECT stuNO, stuName, class, Subjectmarks
        WHERE Student
        FROM age>15
    (3) SELECT, stuName, class, Subjectmarks
        WHERE Student
        From age>15
    (4) SELECT STName, class, Subjectmarks
        FROM Student,
        WHERE age>15
    (5) SELECT StName, Class, Subjectmarks
        FROM Student ,
        WHERE marks>15

27. Select the correct layout corresponding to the following code segment of an HTML document.

    ```
    <ol type="1">
    <li>Animals</li>
    <ol type="i">
    <li>lion</li>
    <li>tiger</li>
    </ol>
    <li>Birds</li>
    <ol>
    <li>parrot</li>
    <li>crow</li>
    </ol>   </ol>
    ```

    (1)
    1.   Animals
       - Lion
       - Tiger
    2.   Birds
       - Parrot
       - Crow

    (2)
    - Animals
      - Lion
      - Tiger
    - Birds
      - Parrot
      - Crow

    (3)
    1.   Animals
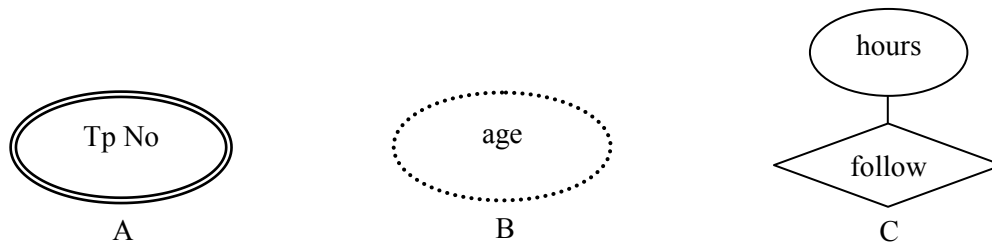   - i.   Lion
       - ii.   Tiger
    2.   Birds
       - i.   Parrot
       - ii.   Crow

    (4)
    1.   Animals
   - i. Lion
       - ii. Tiger
       - iii. Birds
       - iv. Parrot
       - v. Crow

    (5)
    1.0   Animals
    1.1   Lion
    1.2   Tiger
    2.0   Birds
    2.1   Parrot
    2.2   Crow

28. Which of the following statement is incorrect?
    (1) XML is not an alternative to HTML.
    (2) XML is not depend on hardware or software.
    (3) XML is a markup language.
    (4) XML tags are case sensitive.
    (5) XML is introduced for data storing and transferring.

29. Which one of the following shows the type properties of input elements in form of HTML?
    (1) radio, text, textarea   (2) radio, text, checkbox   (3) checkbox, textbox, textarea
    (4) select, radio, textarea   (5) select, radio, textbox

30. What is the correct syntax to be used to insert a JavaScript into an HTML page?
    (1) <script type = "text/javascript">
    (2) <type script = "text/javascript">
    (3) <scripting > = "javascript">
    (4) <scripting language = "javascript">
    (5) <scripting language = "text/javascript">

31. Which of the following devices sends data packets only to receiving device?
    (1) Hub   (2) Switch   (3) Bridge
    (4) Repeater   (5) Modem

32. Which layers of OSI model connect with networking?
    (1) Application layer and Presentation layer
    (2) Session layer and Transport layer
    (3) Transport layer and Network layer
    (4) Network layer and Application layer
    (5) Data link layer and Physical layer

33. Which of the following is a possible IP address in a network with IP address 172.16.10.5 and subnet mask 255.255.248.0
    (1) 172.16.10.10   (2) 172.16.10.5   (3) 172.16.8.0
    (4) 172.16.10.0   (5) 172.16.10.16

34. Consider the following statements.
    A – An operating system is needed to manage Hardware and Software.
    B – Fedora is a copyrighted operating system.
    C – Operating systems are type of Application software.
    Which of the above statements are correct about the operating system?
    (1) A only.   (2) B only.   (3) C only.
    (4) A and B only.   (5) B and C only.

35. Consider the following statements.
    A – Capacity of DVD is higher than CD.
    B – Data storing in a CD takes place upon pits and bumps.
    C – Laser beams are used to read CD, DVD and Blu-ray discs.
    Which of the above statements is/are true?
    (1) A only.   (2) A and B only.   (3) A and C only.
    (4) B and C only.   (5) All A, B and C.

36. Consider the following memory types.
    A - Dynamic Random Access Memory
    B - Static Random Access Memory
    C - Read Only Memory
    D - Cache Memory
    E - Register memory
    Which of the above memory /memories is/are non volatile?
    (1) A only.   (2) B only.   (3) C only.
    (4) A and D only.   (5) C and E only.

37. Consider the following steps.
    A - Fetch next instruction.
    B - Encode the instruction.
    C - Decode the instruction.
    D - Execute the instruction.
    Which of the following steps shows the sequence of the "fetch execution cycle"?
    (1) A,B and C   (2) A,B and D   (3) A,C and D
    (4) B,C and D   (5) A,B,C and D

38. Which of the following is not considered as e-business?
    (1) B2B   (2) B2C   (3) C2C
    (4) A2C   (5) B2E

39. "An agent who buys and sells for free" in an e - Business is called as,
    (1) Content provider   (2) Information broker   (3) Customer
    (4) Online services provider   (5) Store keeper

40. Consider the following terms.
    A - Waterfall
    B - Spiral
    C - Structured
    D - Unified development
    E - Object oriented
    Which of the above represents the system development model?

    (1) A, B and C only.   (2) A, B and D only.   (3) A, C and E only.

    (4) B, C and D only.   (5) A, B and E only.

41. A flat file system is created with admission number (Ad_No), student name (St_Name), national identity card number (NIC), class (ClassID), name of the class teacher (Class_Teacher) and number of students in the class (No_Stu). Which of the following displays the correct relation the second normal form?
    A - Student (Ad_No, St_Name,NIC,ClassID)
        Classdetail (ClassID,Class_Teacher,No_Stu)
    B - Student (Ad_No,St_Name,NIC,ClassID,Class_Teacher)
        Classdetail (ClassID,Location)
    C - Student (Ad_No,St_Name,NIC)
        Classdetail (ClassID,Class_Teacher,No_Stu)
    (1) A only.   (2) B only.   (3) C only.
    (4) A and B only.   (5) B and C only.

42. Which of the following attributes represented by the following symbols (A, B, and C) in a ER Diagram respectively.

(1) Simple attribute, Multivalued attribute and Derived attribute
(2) Multivalued attribute, Derived attribute) and Descriptive attribute
(3) Multivalued attribute, Derived attribute and Composite attribute
(4) Composite attribute, Multivalued attribute and Derived attribute
(5) Derived attribute, Stored attribute and Derived attribute

43. Which of the following represents the three levels of ANSI SPARC model?
(1) External level, Internal level and Complex level
(2) Primary level, Secondary level and Tertiary level
(3) Logical level, Conceptual level and Physical level
(4) External level, Conceptual level and Physical level
(5) Primary level, Logical level and Complex level

44. Which of the following database system model in accordance with Parent-Child relationship in data processing?
(1) Hierarchical
(2) Object oriented
(3) Structural
(4) Network
(5) Relational

45. Identify the candidate key field which is not a primary key field in a database?
(1) Foreign key   (2) Secondary key   (3) Alternate key
(4) Key constraint   (5) Super key

46. Consider the following ER Diagram and Statements.
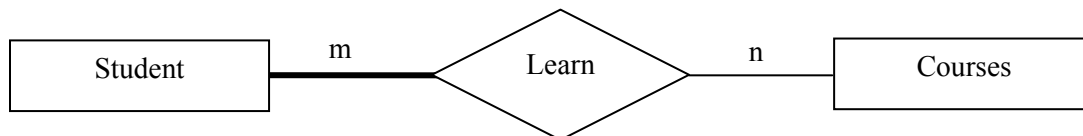
A –Student have full depended relationship and courses have partial dependent.
B – Many to Many relationships exist between students and courses.
C – Degree of relationship is 2.
(1) A only.   (2) A and B only.   (3) A and C only.
(4) B and C only.   (5) All A, B and C.

47. What is not a main Characteristic of a agent in agent technology?
(1) Self execution
(2) Intelligence
(3) Working in a dynamic environment
(4) Advertising
(5) Competitive execution with other agents

48. Consider the following Python Statements.

height = [6.2, 5.8, 5.2, 6.5, 6.3]
count = len(height)
height.sort ()
for i in range (count-1):
        print (height [i]),’,’,

Which of the following is the output of this program?

(1) 6.2   (2) 6.2, 5.8, 5.2, 6.5,   (3) 6.2, 5.8, 5.2, 6.5, 6.3

(4) 5.2, 5.8, 6.2, 6.3,   (5) 5.2, 5.8, 6.2, 6.3, 6.5,

49. Consider the following data items.

A – (5, 8, 9)
B – [12, ‘xyz’, 7.8]
C – {‘Course No’ : ‘C112’, ‘Course name’ : ‘programming’, no_stu : 50}
Which of the following is true about the given data items A,B and C?

(1) Data types are range, list, dictionary respectively.
(2) B[1] = ‘Nimal’ can be used to change as ‘Nimal’ instead of B ‘xyz’ in B.
(3) A[2] = 15 cannot be used to change values in A.
(4) (1) and (2) Statements are correct.
(5) (2) and (3) Statements are correct.

50. Which of the following python statement is syntactically correct and display answer after adding numbers from 1 to 10?

(1) i = 0
     T = 0
     while (i < = 9) :
     i = i + 1
     T = T + i

(2) i = 0
     T = 0
     while (i < = 9) :
        i = i + 1
        T = T + i
     print T

(3) i = 0
     T = 0
     while (i < = 9)
     i = i + 1
     T = T + i

(4) i = 0
     T = 0
     while (i < = 9) :
        i = i + 1
        T = T + i
     print (T)

(5) i = 0
     T = 0
     while (i < = 9)
        i = i + 1
        T = T + i
     print (T)

General Certificate of Education (Adv. Level) Support Seminar - 2012

Sample Paper :- Information & Communication Technology II

Preparation   :- Ministry of Education

Instructions: Duration:- Three hours

❖ Answer all the four questions on this paper itself.

Part A- Structured essay

(1)   (a). State the technological differences between 2nd and 4th generation computers and mention two advantages of 4th generation computers.

(b). Write down the differences between complex instruction set (CISC) and reduced instruction set (RISC) in instruction set architecture (ISA) used in microprocessor.

(c). Answer the following questions using the value -123.75 in IEEE Floating Point Precission Representation.
   (i) The value for the sign bit.

   (ii) Convert 123.75 into binary number.

   (iii) State the above answer (ii) in standard form.

   (iv) What is the value for exponent in the above (iii).

(v) Represent the fractional part in bits.

(vi) Represent the value -123.75 in IEEE 32 .

(2)   (a). Classify the software given below as 'Operating system', 'Application software' or 'Utility Software'

Software	Classification
Disk Defragmentation	
Opera	
Mac	
Screen Server	
Joomla	
Mint	

(b). Briefly explain the following terms which are the main functions of memory management in a computer operating system.

(i) Memory allocation

(ii) Memory swapping

(c). A computer has an 18-bit virtual memory address space where eight bits are used for a page address.
(i) Calculate the total number of pages defined by the above addressing scheme.

(ii) Consider the following virtual memory address 010111010100111101. What is the page and displacement (Offset) of this address?

(d). Write 2 differences of NTFS and FAT32 file systems.

(3)   Consider the following scenario.

An organization maintains details of employees with the employee number, Employee name, date of birth, age and telephone number. Employee name consists of 3 parts First name, Middle name and Last name. And also an employee can have more than one telephone number. The employees are directed to professional development courses. Course number and Course name are considered. Each employee participate pre-defined number of hours in a course. An employee can follow more than one course and for a particular course there can be more than one employee.

(a). Draw the ER diagram for the above scenario.

(b). Identify and state the entities, which are related to many to many (m:m) cardinality in above (a) and draw the part of the ER diagram after removing the m:m relationship.

(c). "ER diagrams allow attributes to be assigned on relationships". Write the name of this type of attribute. Explain your answer by using the given scenario.

(d). Write the relational schema which are mapped, with related to the 3rd normal form for the above scenario.

(4)　(a).　Variation of physical sizes of computer memories are numbered as 1 to 5 in the given table in ascending order. Study the table and number them in accordance with the criteria in each column heading.

Memory type	Criteria				
	Physical size	Access time	Access speed	Capacity	Cost per byte
Register	1				
Cache memory	2				
Secondary storage memory	4				
Remote secondary storage memory	5				
Random access memory	3				

(b)　(i) Compare two differences of Dynamic random access memory and Static random access memory.

Dynamic random access memory (DRAM)	Static random access memory (SRAM)
1	
2	

(ii) SRAM is most suitable to be used for registers and cash memory. Give reasons ?

(c)

Student

Ad_No	Std_Name	Grade	Gender
A001	Samanthi	12 Art	Female
A002	Kamal	12Art	Male
A003	Sanjeeva	12Com	Male
A004	Sanduni	12Art	Female

(i) Write SQL statements to develop a database table as in above figure.

(ii) Write SQL statements to input the value (A005, Nimal, 12, 12Sci, Male) in to the table.

(iii) Write the SQL statement to enter a new field as 'Tel No' VARCHAR (10).

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Sample Paper :- Information & Communication Technology II

Preparation   :- Ministry of Education

Instructions:

❖ Answer any four questions only.

Part - B

(1)   (a). Computer memory is classified as volatile and non volatile. Name three basic volatile memories.
             List the functions of each of those three volatile memories.
        (b). Calculate the wastage in file space due to incomplete filling of   the last cluster for a file of size
             25200 bits (Assume that a cluster has a size of 512 bytes.)
        (c). Answer the following questions considering the following logic circuit.
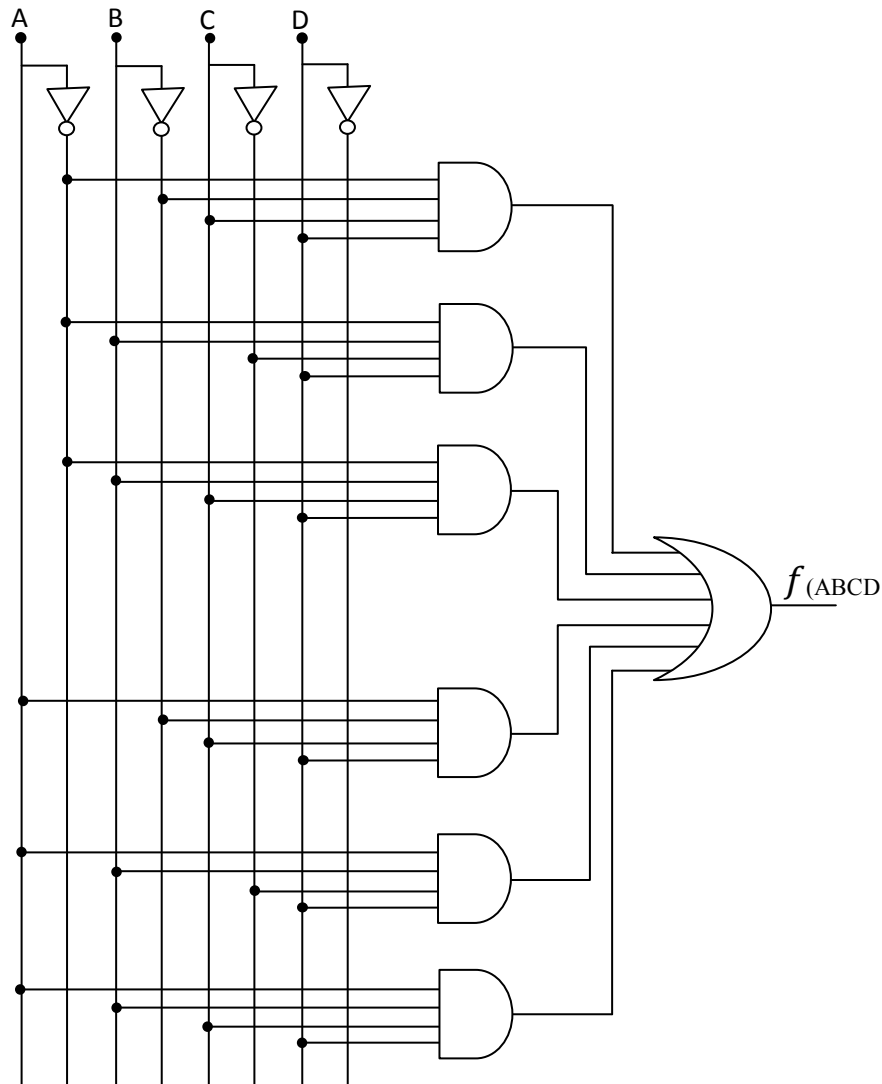
(i) Draw the truth table considering for every AND gate that output is 1.
(ii) Write down the Boolean expression for the output of the above circuit using a truth table.
(iii) Simplify the above expression using Boolean algebra or Karnaugh (K-Map).
(iv) Design the logic circuit for the answer you have obtained in above (iii).
(v) Convert the Boolean expression you obtained for the above part (ii) to Product of Sum (POS).

(2) (a). Compare the following protocols .
    (i) File Transfer Protocol (FTP)
    (ii) Hyper Text Transfer Protocol (HTTP)

(b). Describe the process of the following devices.
    (i) Repeater
    (ii) Bridge

(c). What is the main advantage of using classless IP address rather than classfull IP address?

(d). An organization uses the following IP addresses. Write down the classes, network address, and subnet mask.

IP address	Subnet mask	Network address	Class
172.16.10.0/16			
10.10.10.0/10			
192.168.10.0/26			
190.100.100.10/19			

(3) Consider the following figure which shows a web page of Learning Management System of ABC Institute.
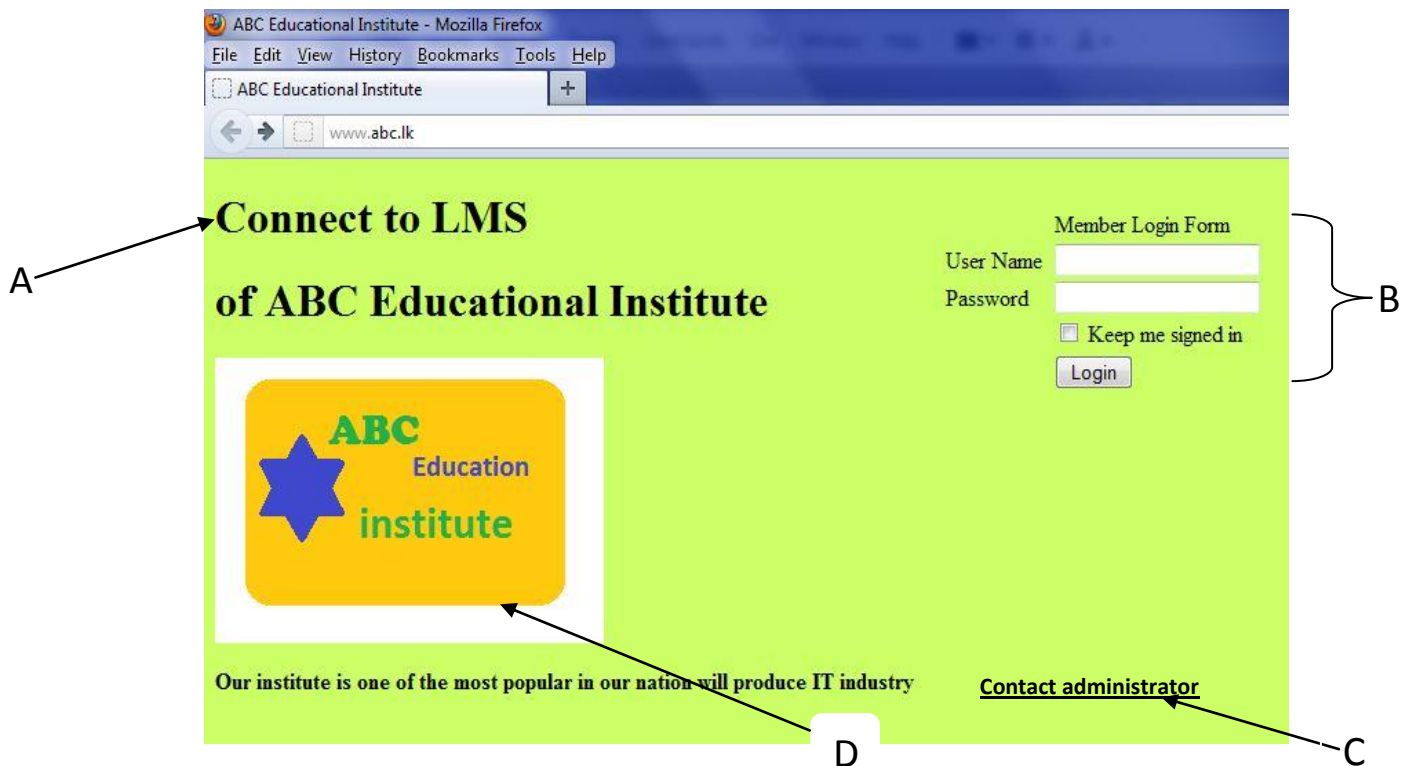
Answer the following questions using the above figure.

(a). Above web site is designed using HTML and CSS is used to make it more attractive. Write down two advantages of using CSS.
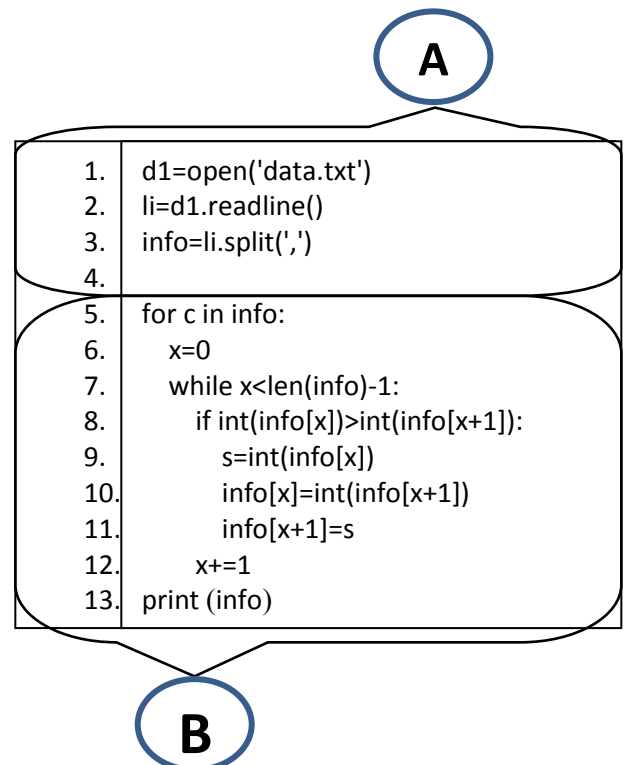
(b). It is required to format the above paragraph **A** in "arial" font type, font size 16 and in red color. Write down the CSS code segment for it .

(c). Write down the HTML code segment to create the above member login form B.

(d). Write down the HTML code segment to insert the image **D** to the web page (Assume that above image "abc.jpg" is in the "images" sub folder of "myweb" folder).

(e). When new members are added to the ABC Institute, you should click on "contact administrator" hyperlink to access admin .html page. Write down the HTML code segment to create this hyperlink.

(4) (a). Some programming languages use both compiler and interpreter. First the source code is compiled into byte code and next it is interpreted in these languages. Explain the advantages of using both compiler and interpreter instead of using only compiler?

(b). Identify the computer language generations which used to write Instruction Set Architecture (ISA) of Micro Processors and SQL. Describe two differences of these generations.

(c).

```
d1=open('data.txt','r')
li=d1.readline()
info=li.split(',')
for c in info:
x=0
while x<len(info)-1:
if int(info[x])>int(info[x+1]):
s=int(info[x])
info[x]=int(info[x+1])
info[x+1]=s
x+=1
print( info)
```

(i) Name flow control structures you noticed in this Python Program.

(ii) Show how these flow control structures can be represented in a flow chart.

(d). Python module which contains the following program is saved in the "mypro" folder as "dataAsc.py". This folder contains "data.txt "file too.

data.txt → 4,8,5,3,1,9,4,6,2,7

A
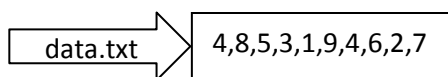
(i)   This program is divided into A and B for the purpose of understanding. Describe the function of **A**.

(ii)   The process in B is a "selection" technique. How do you name it ?

(iii)   Explain the process shown in B.

(iv)   Write down the output of this program after execution.

```
1.  d1=open('data.txt')
2.  li=d1.readline()
3.  info=li.split(',')
4.
5.  for c in info:
6.      x=0
7.      while x<len(info)-1:
8.          if int(info[x])>int(info[x+1]):
9.              s=int(info[x])
10.             info[x]=int(info[x+1])
11.             info[x+1]=s
12.      x+=1
13. print (info)
```

B

(5) (a) Compare the difference between White box testing and Black box testing.

(b). ABC institution is intended to convert its business into computer based system. Briefly explain the system analyst's role in terms of the stages of System Development life cycle.

(c). List two advantages of using spiral model rather than waterfall model for the above.

(d). In system analysis, Data Flow Diagram (DFD) is a system analysis tool used by the system analyst. What are the two facts represented in this diagram?.

(e). The owner of the business has said that parallel implementation is more suitable way to install a new computer based information system. Briefly explain two reasons to support his statement.

(6) (a). Explain the difference between e - business and e - commerce.

(b) Explain following business organizations with examples for each of them.

- Pure brick
- Brick and Click
- Pure Click

(c). Imagine that the government has decided to provide service (G2C) to the citizens through e-business only. Explain two advantages and two disadvantages of it.

(d). Write down four uses of emotional computers.

(e). What is the basic difference between Von Neumann and Quantum models. For what purpose Quantum computers are used?