# General Certificate of Education (Advanced Level) Support Seminar-2013

Sample paper:- Information & Communication Technology 1

Preparation:- Ministry of Education

Duration:- Two hours

Instruction :

- Answer all the questions.
- Use of calculators is not allowed.
- 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. Who developed the first ,"Automatic Sequence Controlled Calculator".
   (1) Howard Aiken (2) Charles Babbage (3) Blaise Pascal
   (4) Ada Augasta Lovelace (5) Gottfried Wilhelm Von

2. ".....technology was used in fourth generation computers." Which of the following is the most suitable word to fill in the balnk.
   (1) Vacuum tube (2) Transistor (3) Integrated circuit
   (4) VL-Transistor (5) Micro processor

3. Which of the follwing consisit of correct sequence of Data Processing Life Cycle.
   (1) Data input, Data collecting, Data processing,Data storing ,Data Output.
   (2) Data collecting, Data processing, Data storing, Data input, Data Output.
   (3) Data collecting, Data input, Data processing,Data storing, Data Output.
   (4) Data input, Data collecting, Data storing, Data processing,Data Output.
   (5) Data input, Data processing, Data collecting,Data storing, Data Output.

4. Consider the following memory types.

   A. Read Only Memory

   B. Secondary Storage

   C. Register Memory

   D. Flash Memory

   E. Random Access Memory

   Which of the above can be classified as a Volatile Memory.
   (1) (A) and (B) (2) (A) and (C) (3) (A) and (D) (4) (C) and (E) (5) (D) and (E)

5. $351_{16}$ (hexa decimal) is equals to...
   (1) $1521_8$ (2) $849_8$ (3) $1251_8$ (4) $6504_8$ (5) $1D_8$

6. "GPRS" stands for…….
   (1) General Protocol Recall Service
   (2) Generation Packet Radio Service
   (3) General Protocol Recall Service
   (4) General Packet Radio Service
   (5) General Protocol Radio Service

7. Consider the following statements.
   A. In data based management,large amount of data can be stored in organised manner.
   B. Data management is more accurate in tradional methods.
   C. Admission register of a school is an example of flat file system.
   Which of the above statement/s is/are true.
   (1) (A) only. (2) (B) only. (3) (C) only.
   (4) (A) and (C) only. (5) All of the above.

8. Given below are some of the advantages of using fiber optic cable over copper wires in data communication.
   A. Electromagnetic waves do not interfere.
   B. High speed of transmission.
   C. Resistance to mechnaical shocks.
   D. Ability to wire with shrpe bents.
   E. Higher distance of data transmission.
   Which of the following consisit of true statements.
   (1) (A) and (B) only. (2) (B), (C) and (D) only. (3) (A), (B), (C) and (E) only.
   (4) (A), (B), (C) and (D) only. (5) All of the above.

9. Which of the following command is issued to identify that which line, computer or router not functioning as expected in a computer network.
   (1) Tracert (2) Ping (3) IPConfig (4) Netstat (5) Hostname

10. In system development a feasibility study is conducted by……..
   (1) Managers of an organization.
   (2) Intended users of the system.
   (3) System analysists upon instructions of managers of the organization.
   (4) Senior programmers upon instructions of both the proposed users and managers of the organization.
   (5) Software engineers.

11. Which of the following is true about system testing.
   (1) Each component of a system is inspected at the implementation phase.
   (2) Unit testing is conducted by project manager.
   (3) Acceptance testing is used to inspect whether each tested module is combined accurately.
   (4) Acceptance test is conducted by software development team only.
   (5) Integrated testing is performed by software development team including software engineers and project managers.

12. 8 bit first compliment and second compliment of decimal 111 is…….
   (1) 1101111 and 10010000 (2) 10010000 and 10010001 (3) 10010001 and 10010000
   (4) 10010000 and 01101111 (5) 10010001 and 01101111

13. Consider the following statements about HTML.
   (A) HTML tags describe document content.
   (B) HTML documents contain HTML tags and plain text.
   (C) The browser displays the HTML tags.
   Which of the above is/are true.
   (1) (B) only. (2) (A) and (B) only. (3) (A) and (C) only.
   (4) (B) and (C) only. (5) All of the above.

14. Which of the following is the equivalant boolian expression to A ⊕ B ⊕ C
(1) A'BC + AB'C + ABC' (2) AB'C'+ A'BC'+ A'B'C
(3) A'BC+ AB'C+ ABC'+ ABC (4) AB'C'+ A'BC'+ A'B'C+ ABC
(5) AB' + A'B + AC' + A'B + BC' +B'C

15. A. In Full-duplex data communication always transmission takes place to both direction.
B. A student responds to teacher after a question is asked by the teacher in a class. This ia an example of half duplex communication.
C. Television broadcasting is an example of half duplex communication.
Which of the above statement/s is/are true about communication.
(1) (A) only. (2) (B) only. (3) (C) only.
(4) (A) and (B) only. (5) (B) and (C) only.

16. A. The capacity of DVD (digital versatile disk) is higher than a CD (compact disk).
B. Data writing on a CD take place with pits and bumps.
C. Lazer rays are used to read data on CDs and DVDs.
Which of the above statement/s is are true about data storing in optical media.
(1) (A) only. (2) (A) and (B) only. (3) (A) and (C) only.
(4) (B) and (C) only. (5) All of the above.

17. Which of the following operating system is suitable for a Aircraft Defense System.
(1) Real time (2) Multi Threading (3) Single user-Single tasking
(4) Single user-Multi tasking (5) Multi user-Multi tasking

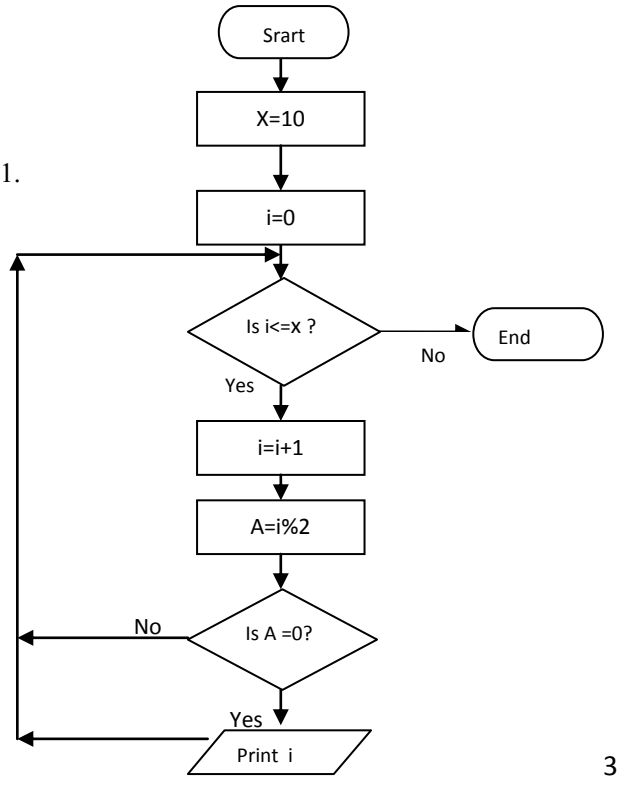
18. Study the following statements on waterfall modle of system development.
A. It is more suitable for daily used projects that user requirements are well identified.
B. It is not possible to follow this modle in data system projects always in real world.
C. This model is carried out step by step.
Which of the above statement/s is /are true.
(1) (A) only. (2) (B) only. (3) (A) and (B) only.
(4) (B) and (C) only. (5) All of the above.

19. Autonomous, Problem Solving computational entities capable of effective operation in dynamic and open environments are defined as…….
(1) Evolutionary computating
(2) Agent Technology
(3) Ubiquitous computing
(4) Von-Neumann concept
(5) Quantum computing

Consider the given flow chart to answer question 20 and 21.

20. What are the control structures used in the Flow chart?
(1) Selection only.
(2) Selection and Sequence only.
(3) Sequence and Iteration only .
(4) Selection and Iteration only.
(5) Selection, Sequence and Iteration.

21. Which of the following is true about the flow chat.
(1) It stops when i equals 10.
(2) It stops when i equals 11.
(3) It displays 0, 2, 4, 6, 8,10.
(4) It displays integers from 1 to 10.
(5) It displays 2, 4, 6, 8 only.



22. Which of the following is equivalant to $F_{(X,Y)} = (A' . B')'. (A + B)'$ after simplifying the following Boolean statement by using De morgan theoram.
(1) 0 (2) 1 (3) A (4) B (5) A.B

23. Which of the following is the output of python statement >>>(3+15)%4+3**2
(1) 6 (2) 9 (3) 11 (4) 25 (5) 49

24. Which of the following is used to send data packets directly to its receiving device in a LAN.
(1) Hub (2) Switch (3) Bridge (4) Repeater (5) Modem

25. Study the following statments about the given data base table.

| STUDENT |
|---|
| INDEX_NO |
| NAME |
| DOB |
| SEX |

A. Student is an entity.
B. Index NO field can be used as primary key.
C. NAME, DOB are two attributes of table.
D. Collection of data in all attributes of a certain student is named as a record.
Which of the above statement/s is/are true.
(1) (A) and (B) only. (2) (B) and (C) only. (3) (C) and (D) only.
(4) (A), (B) and (C) only. (5) All of the above.

26. Study the following statements regarding object relational model.
A. Object oriented computer languages are used to develop a data management system.
B. It can be used in computer aided drawing.
C. It is also known as Extended Relational Model .
Which of the above statement/s is/are true.
(1) (A) only. (2) (B) only. (3) (A) and (B) only.
(4) (B) and (C) only. (5) All of the above.

27. Study the following statements regarding **physical schema** for the development of data management system.
A. It is close to physical storage.
B. It creates a supporting data structure called index.
C. It is used by database designers and database administrators.
D. It is an abstracts of whole project.
E. It explains data storing pattern.
Which of the above statements are true.
(1) (A), (B) and (C) only. (2) (A), (B) and (E) only. (3) (B), (C) and (D) only.
(4) (B), (C) and (E) only. (5) (C), (D) and (E) only.

28. Which of the following statements clearly describes direct implementation in system development.
(1) Introduction of new system with the existing system.
(2) Execution of one segment and execute the other if the first segment is successful.
(3) Introduction of new system after terminating of existing system.
(4) Introduction of new system step by step.
(5) Execution of both systems one after the other.

29. Consider the following HTML tag.
<img src = "Rose.jpg" alt = "Rose Flower" width = "300" height = "200">
A. The above HTML tag renders the image named "Rose.jpg" by the browser.
B. The browser knows the size (width and height) of the image, without width and height.
C. The Alt attribute provide alternative information for an image if a user for some reason can not view it.
Which of the above statements are true.
(1) (A) and (B) only. (2) (A) and (C) only. (3) (C) and (D) only.
(4) (A), (B) and (C) only. (5) (A), (C) and (D) only.

30. In which of the followings the Ubiquitous technology is not used.

(1) Customizations of automobiles
(2) Customizations of Domestic environments
(3) Controll of crimes
(4) Location tracking
(5) Design of combinational logic circuits

31. Which of the following HTML code segment can be used to display following table in a browser.

**Contact Details:**

| Guardian | Telephone | |
|---|---|---|
| Mr.Perera | 0718234567 | 0372211111 |

(1)

```
<html>
<body>
<h4>Contact Details:</h4>
<table border="1">
<tr>
<th>Guardian</th>
<th Colspan="2">Telephone</th>
</tr>
<tr>
<td>Mr.Perera</td>
<td>0718234567</td>
<td>0372211111</td>
</tr>
</table>
</body>
</html>
```

(2)

```
<html>
<body>
<h4>Contact Details:</h4>
<table border="1">
<td>
<th>Guardian</th>
<th Colspan="2">Telephone</th>
</tr>
<tr>
<td>Mr.Perera</td>
<td>0718234567</td>
  <td>0372211111</td>
  </tr>
  </table>
  </body>
  <html>
```

(3)

```
<html>
<body>
<h4>Contact Details:</h4>
<table border="1">
<tr>
<th Colspan="2">Guardian</th>
<th>Telephone</th>
</tr>
<tr>
<td>Mr.Perera</td>
<td>0718234567</td>
<td>0372211111</td>
</tr>
</table>
</body>
<html>
```

(4)

```
<html>
<body>
<title> Contact Details : </title>
<table boarder =  “1”>
<tr>
<th>Guardian</th>
<th Colspan = “2”>Telephone</th>
</tr>
<tr>
<td> Mr. Perera</td>
<td>0718234567</td>
<td>0372211111</td>
</tr>
</table>
</body>
</html>
```

(5)

```
<html>
<body>
<h4> Contact Details : </h4>
<table boarder =  “1”
<tr>
<th>Guardian</th>
<th rawspan=“2”>Telephone</th>
<tr>
<tr>
<td> Mr. Perera</td>
<td>0718234567</td>
<td>0372211111</td>
</tr>
</table>
</body>
</html>
```

Consider the given SQL statement to create "STUDENT" and "LENDING_BOOK" tables. And answer question 32 and 33.

```
CREATE TABLE LENDING_BOOK
(
ACCT_REG            VARCHAR(10)     NOTNULL,
BOOK _NAME          VARCHAR(20)     NOTNULL,
AUTHOR              VARCHAR(25)     NOTNULL,
DESCRIPTION         VARCHAR(75),
ISSUED_DATE         DATE,
STUDENT_ID          CHAR(5)         NOT NULL,
PRIMARY KEY (ACCT_REG));
```

```
CREATE  TABLE  STUDENT
(
STUDENT_ID          CHAR(5)         NOTNULL,
NAME                VARCHAR(25)     NOTNULL,
BIRTHDAY            DATE            NOTNULL,
ADDRESS             VARCHAR(25)     NOTNULL,
PROVINCE            CHAR(10),
PRIMARY KEY (STUDENT_ID));
```

32. Consider the following statements.

A. "STUDENT_ID field can be used to connect STUDENT and LENDING_BOOK tables.
B. It is compalsory to input data in to **DATE** data type fields of both the tables.
C. A comma " , " can be used instead of " ; " in PRIMARY KEY(STUDENT_ID));
D. It is compalsory to place a comma " , " between two fields.

Which of the following statements are true.

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

33. Consider the following statements.

A. STUDENT_ID is the FOREIGN KEY of LENDING_ BOOK table
B. It is not complasory to input data to the STUDENT_ID field
C. CHAR data type can be included in BIRTHDAY field of STUDENT table.
D. It is compalsory to input data to PROVINCE field.

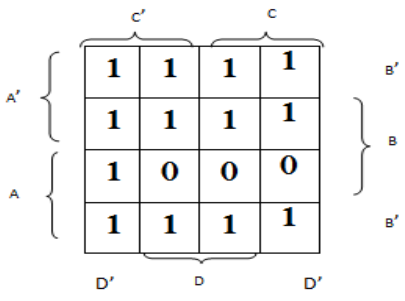
Which of the above statement/s is/are true.

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

34. Meaning of software piracy is .....

(1) Stealing of software at home. (2) Coping software.
(3) Stealing of software from manufactuing company. (4) Coping from purchased software.
(5) Making of illegal copies of software on which the user has no copy right .

35. Consider the following Karnaugh map.




Which is the correct logic expression when you simplify it using given values.

(1) A' + AB' + C'D' (2) A' + B' + AD'C'
(3) A' + B' + C'D' (4) C'D' + A'C'+ A'C' + B'
(5) B'C + B'C' + A'C + C'D'

36. Consider the following statements.

A . Operating systems are Utility software.

B . An operating system is needed to control hardware and to manage software.

C. Apple Macintosh is Free & Open source operating system.

Which of the above statement/s is/are true.

(1) (A) only. (2) (B) only. (3) (C) only.

(4) (A) and (B) only. (5) (B) and (C) only.

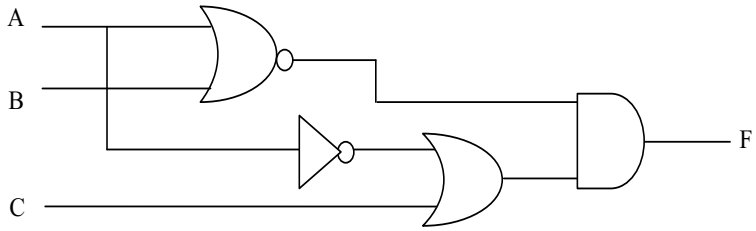
37. Which of the following is the correct Boolean expression that corresponds to output "F".

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

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

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

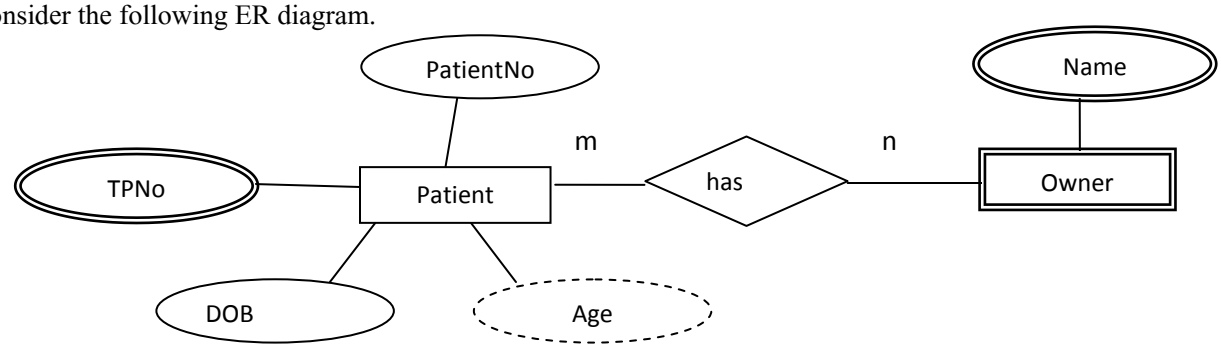
D. $(\overline{A+B}).(\bar{A}+C)$




(1) (A) and (B) only. (2) (A) and (C) only. (3) (B) and (C) only.

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

38. Consider the following ER diagram.




Which of the following statement/s is /are true.

A. Owner is an Weak entity.

B. m: n is the cardinality coefficient of above relationship.

C. DOB is a "stored attribute" while "Age" is a derived attribute.

(1) (A) only. (2) (A) and (B) only. (3) (B) and (C) only.

(4) (A) and (C) only. (5) All of the above.

39. Consider the following statements.

A. Fequent Refreshing take place in DRAM while SRAM has no such fequent refreshing.

B. Cache Memory belongs to the category of SRAM

C. Present day most of computers has SRAMS.

Which of the above statement/s is/are true.

(1) (A) only. (2) (B) only. (3) (C) only.

(4) (A) and (B) only. (5) (B) and (C) only.

40. Consider the following HTML tag.
User name:<input type= “text” name= “username”>

A. It defines a one line input field that a user can enter text.

B. It is the correct HTML tag for creating a text input field.

C. It is the correct HTML tag for creating a text area.

Which of the above statement/s is/are true.

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

41. Which of the followings is the correct statement regarding IP addresses and subnet masks.
(1) 192.156.6.3 is an example of class “B” IP address.
(2) 6(six) host computers can be connected to a network with a subnet mask of 255.255.255.148 .
(3) IPV4 addresses contain 8 bits.
(4) 220.32.1.5 is an example of class “C” IP address.
(5) 255.255.0.0 is an example of class “C” IP address.

42. Which of the following layer of OSI reference model that is responsible for data transmission through a communication media.
(1) Transport layer (2) Session layer (3) Physical layer
(4) Network layer (5) Data link layer

43. Which of the following python statement is syntactically correct to display multiplication table?

```
(1) for j in[2,3,4,5]:
print(Multiplication of ; j)
for k in range(1,12):
Print(j*K)
Print()
```

```
(2)for j in[2,3,4,5]:
        print(‘Multiplication of : ’,j)
        for k in range(1,12):
                Print(j*K)
Print()
```

```
(3) for j in[2,3,4,5]:
        print(Multiplication of : , j)
        for k in range(1,12):
                Print(j*K)
Print()
```

```
(4) for j in[2,3,4,5]:
        print(‘Multiplication of : ’ j)
for k in range(1,12):
                Print(j*K)
Print()
```

```
(5) for j in[2,3,4,5]:
        print(‘Multiplication of : ’ j)
for k in range(1,12):
                Print j*K
Print()
```

44. Consider the following python statement.

```
DataList=[52,90,67,99]
for i in DataList:
    if i< 90:
        print(i)
    break
print('end')
```

Which of the following is the correct output.

(1)
```
52
end
```

(2)
```
52
90
67
```

(3)
```
52
90
67
end
```

(4)
```
52
90
67
90
end
```

(5)
```
52
end
90
end
99
end
```

45. Consider the following python codes.

```
>>> List1=[5,6,7,8]

>>> List2=[9,10,11,12]

>>> L=List1+List2

>>> Print(L)
```

Which of the following is the output of it.

(1) 5,6,7,8,9,10,11,12 (2) [5,6,7,8]+[9,10,11,12] (3) [5,6,7,8,9,10,11,12]
(4) (5,6,7,8)+(9,10,11,12) (5) List1[5,6,7,8]+List2[9,10,11,12]

46. Consider the following python codes.

```
def fun(a):
    i , c=1,a[0]
    while  i<len(a):
        if (a[i]) >c:
            c=a[i]
        i=i+1
    return i
print(fun([9,3,11,15,-1]))
```

Which of the following is the output of it.

(1) -1 (2) 3 (3) 5 (4) 8 (5) 15

47. Consider the following incomplete python code segment that is used to arrange data items of "marks" data structure in desending order.

```
marks=[28,75,52,89,68]

datacount=len (marks)

fori in range(datacount-1):

        for k in range(i+1,datacount):

            if  ……..     marks[i],marks[k]=marks[k],marks[i]
```

Which of the following is the suitable statement to fill in the blank.

(1) marks[i]<marks[k]; (2) marks[i]>maks[k]; (3) marks[i]=marks[k]:
(4) marks[i]<marks[k]: (5) marks[i]>marks[k]:

48. Consider the following python statement.

```
A=32.7
B={'Age':21,'Name':'Perera'}
C=(28,95,'Kamal')
D={5,10,15,'sarath'}
```

Which of the following contains relevant data types for A, B, C, and D respectively.

(1) float, tuple, list, dictionary (2) integer, dictionary, list, dictionary
(3) float, dictionary, tuple, dictionary (4) float, tuple, dictionary, set
(5) float, dictionary, tuple, set

49. Consider the following python statement.

```
data=[25,28,30,40,85,92,100]
for i in data:
    if  i>= 40:
        print(i, end=',')
```

Which of the following is the output.

(1) 25, 28, 30 (2) 25, 28,30,40 (3) 85, 92, 100
(4) 40, 85, 92, 100 (5) 25, 38, 30, 37, 85, 92, 100

50. Consider the following python statement.

```
fo1=open('numbers.txt','r')
fo2=open('store.txt','w')
line=fo1.read()
data=((line.strip()).split(','))
forval in data:
        fo2.write(("{0:d} \t {0:x} \t {0:b}\n".format(int(val))))
fo1.close()
fo2.close()
```

Contents of number.txt is given below.

```
2,5,10,12,15,20
```

Which of the following is the content of store.txt after execution of the program.

(1)
```
2  5  10  12  15  20
```

(2)
```
2  5  10  12  15  20
2  5  10  12  15  20
2  5  10  12  15  20
2  5  10  12  15  20
2  5  10  12  15  20
```

(3)
```
2d  5x  10b  12n
2d  5x  10b  12n
2d  5x  10b  12n
2d  5x  10b  12n
2d  5x  10b  12n
```

(4)
```
2   2   10
5   5   101
10  a   1010
12  c   1100
15  f   1111
20  14  10100
```

(5)
```
2   5   10   12   15   20
2   5   a    c    f    14
10  101 1010 1100 1111 10100
```

**General Certificate of Education (Advanced Level) Support Seminar-2013**

Sample Paper :- Information & Communication Technology II

Preparation :- Ministry of Education

**Time Duration: 3 hours**

**Instructions:**

- Answer all the questions on this paper itself.

## Part A-Structured Essay

(1).(a)

(i) Provide a suitable definition for a system.

……

……

(ii) Using the definition suggested in (i) above, show that a refrigerator is a system.

……..

……..

(iii) State whether the refrigerator is an open system or a close system. Justify your answer.

……..

…….

(iv). State whether the following requirements of a motor car are functional.

Proper functionality of break system of a car.

…….

The car should not emit harmful gases to the environment.

……..

(b) Examples for B2B, B2C, and C2C in E- Commerce are mentioned below. State the type for each example

(i) Sama who lives in a foreign country orders a flower bouquet for her mother's birthday using web based service.

……

(ii) Wholesale vehicle dealers order vehicles online.

……

(iii) Saman orders a computer online from a computer manufacturing company.

.....

(iv) Sarath designed a website that consists of a collection of old stamps. Kamal is buying stamps from website.

…….....

(c) Consider the following scenario.

ICT teachers selected from schools islandwide, work as members of the Hardware and Network Solution Pool established by the Ministry of Education for the purpose of proper maintenance of school computer laboratories .The ministry identified that conducting regular meetings to discuss technical difficulties and exchanging knowledge are time consuming .

(i) Suggest a suitable method to solve their hardware maintenance problems based on the Information Communication Technology from their school.

.....……..

(ii) Name three ICT devices that are needed for the method you suggested in (i) above.

……..

(2).

(a). (i) What are the basic components of data communication system?

……

……

(ii) Name three (3) transmission impairments in data communication.

……

……

(iii) What are the three modulation methods in analog signals in data communication?

……

……

(iv) Explain one of the above modulation methods.

……

……

(b). Given below is part of the output screen after executing "inconfig/all "command.

```
Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Broadcom NetXtreme 57xx Gigabit Controlle
r
   Physical Address. . . . . . . . . : 00-23-AE-0C-2B-45
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::55e6:4ebe:221c:9c6%10(Preferred)
   IPv4 Address. . . . . . . . . . . : 172.20.31.2(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 172.20.31.254
   DHCPv6 IAID . . . . . . . . . . . : 234890158
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-15-E6-E7-D5-00-23-AE-0C-2B-45

   DNS Servers . . . . . . . . . . . : 172.20.100.100
                                       172.20.100.101
   NetBIOS over Tcpip. . . . . . . . : Enabled
```

Consider the above to answer the question given below.

(i) Write down the MAC address.

……

(ii) What is the logical address?

……

(iii) What is the function of the DNS server?

……

……

(3)

| ***Production*** | | | | |
|---|---|---|---|---|
| **Pro_No** | **Pro_Type** | **Pro_Name** | **Unit_Price** | **Sale_Price** |
| MLK02 | Diary Milk | Anchor | 330.00 | 325.00 |
| MLK04 | Diary Milk | Maliban | 325.00 | 320.00 |
| MLK03 | Butter | Anchor | 130.75 | 128.75 |
| MLK06 | Diary Milk | Lakspray | 338.00 | 330.00 |
| MLK07 | Butter | Maliban | 128.50 | 125.50 |

(a) Construct a SQL statement to design a database table which contains attributes relevant to the table.

.....

……

……

.

……

(b) What is the SQL statement which is used to add the following record to the table?

MLK08 Butter Lakspray 125.00 128.00

……

……

……

(c) Write down the SQL statement to display Pro_Type, Pro_Name and Unit_Price which products are not similar to "Lakspray" in the Pro_Name field.

……

……

……

(c)
```
UPDATE Production
SET Unit_Price=335.00
WHERE Pro_No='MLK04'
```
What would be the output of this SQL statement ?

……

……

(d)
```
SELECT Pro_Name,Sale_Price
FROM Production
WHERE Unit_Price-Sale_Price>3
```
What would be the result of this SQL statement ?

……

……

……

(4) (a) (i) Describe how you would input 3 integer values and output the largest value.

……

……

……

(ii) Develop a flow chart to represent an algorithm, based on the method suggested in (i) above, to output the largest value.

(iii) Convert the flow chart you have the above (ii) into a pseudo code.

……
……
……
……
……
……
……
……
……

(b) Show how the computation of 14+(-3) is done in 8 bit two's complement arithmetic. Explain how you deal with the carry generated in the most significant bit.

……
……
……
……

**General Certificate of Education (Advanced Level) Support Seminar - 2013**

Sample Paper :- Information & Communication Technology II

Preparation :- Ministry of Education

**Instructions:**

- Answer any four questions only.

## Part B

(1).

(a) (i) Briefly explain the functions of Arithmetic and Logical Unit (ALU ) and Control Unit (CU) in computer data processing.

(ii) Write down three advantages of manual data processing over electronic data processing.

(b) An air craft is equipped with an quality control system with sensors that functions in accordance with temperature of engine, pressure and rotation speed of shaft.

A warning bulb in pilots cabin is on when there is a risk and the risk levels are given below.

* When internal temperature is above 400 degrees centigrade.

**and**

* Internal pressure is above 1.5Mpa or rotation speed of the shaft is less than 4000.

In a dangerous situation,

1.When the internal temperature is above 400 $^{o}$C, 'A' temperature sensor is switched on automatically.

2 When the internal pressure is above 1.5Mpa, 'B' sensor is switched on automatically.

3.When the rotation speed of the shaft is less than 4000, 'C' sensor is switched on automatically.

Following table shows the input control system of the security alarm bulb and the relevant Boolean value.

| Input | Condition/Process | Boolean Value |
|---|---|---|
| A | Internal temperature is above 400 $^0$C. | 1 |
| B | Internal pressure is above 1.5 MP. | 1 |
| C | Rotation speed of the shaft is greater than 4000. | 1 |
| A | Internal temperature is below 400 oC. | 0 |
| B | Internal pressure is below 1.5 MP. | 0 |
| C | Rotation speed of the shaft is less than 4000. | 0 |

(i) Design the circuit by using a combination of only AND, OR, NOT gates to implement the above control system.

(ii) Construct a truth table to represent the functionality of the above circuit.

(iii) Write a Boolean expression (not simplified) for the final output to represent the truth table.

(iv) Simplify the expression obtained in the above part (iii) using the Boolean laws or Karnough map.

(v) State with A, B and C, under which condition of the engine, the security alarm bulb is lit? (There may be several possibilities)

(2). (a) What would be the responses by a browser for a “hr” tag and for “paragraph” tag in an HTML document?

(b) What will be displayed when the following HTML code segment is rendered?

Thiththawella Tank

Thiththawella tank is located in the North Western Province

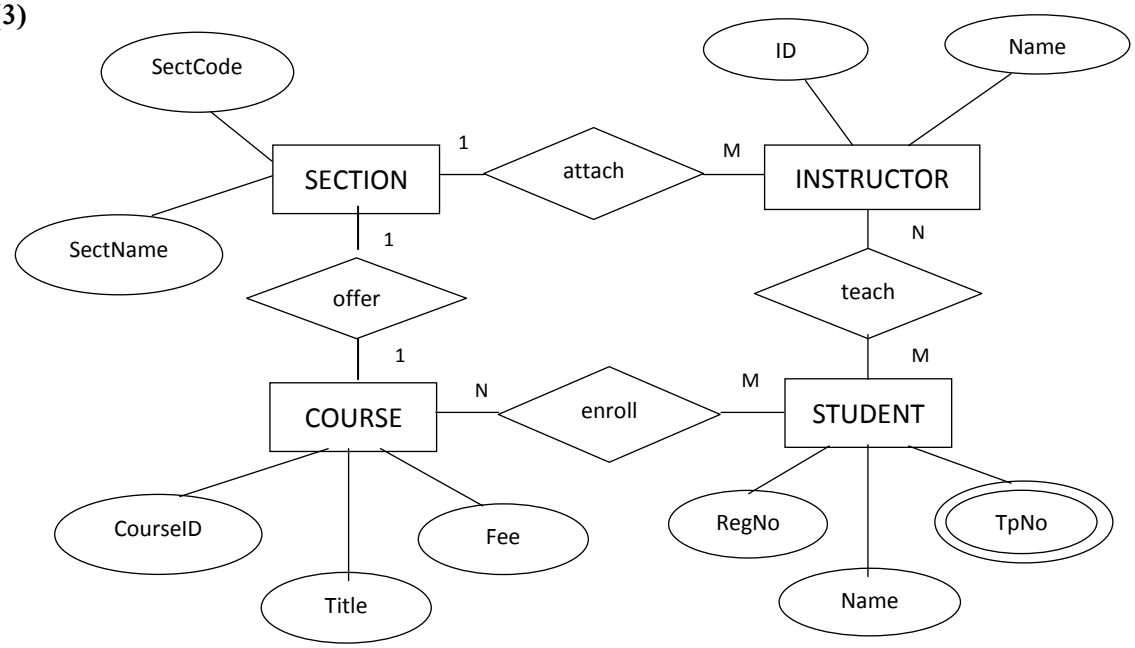
<hr>

Birds

Forty two bird species were observed at the tank

(c) Young Zoologists Association(Y ZA) requires a web page as given below.Write html codes to produce the web page. Assume that the name of the image file is “turtle.jpg”. The words , Young Zoologists Association, Kosgoda Turtle Hatchery, shoud link to the sites “http://www.yza.com”, “http://www.Kturtle.com” respectively.

**(3)**




Consider the ER diagram related to an Educational Institute.

(a) Name the entities given here and state the relationship among the entities.

(b) Classify all the relationship in the above ER Diagram as One to One, One to Many and Many to Many. Justify your answer.

(c) Name the multi-valued attribute in the above diagram and What are the special characteristics of multi-valued attributes given in the above diagram?

(d) What are the suitable attributes for a unique key?

(e) Name two Composite attributes which can be added to the Name field.

(f) Create relevant SQL statement to construct the table COURSE

(4)

(a) A company has several departments and networks. Following are the number of computers in each department.

| | Department | No of computers |
|---|---|---|
| A | IT | 28 |
| B | Accounts | 16 |
| C | Human Resource | 9 |
| D | Administration | 6 |
| E | Purchase | 25 |

192.168.10.10 IP Address is assigned to a computer in the computer network of the IT department.

(i) State the number of sub networks suitable for this computer network and the number of computers connected to a sub networks respectively.

(ii) Write down the subnet mask for the above computer network.

(b) IP addresses of two computers for sub networks of Human Resources and Administration Departments are192.168.10.65 and 192.168.10.97 respectively.

(i) Name devices needed to connect these two physical networks for communication.

(ii) Briefly explain the above device's functions.

(iii) Draw a network diagram to connect these two departments, using above devices in b (i) and write down all suitable IP addresses assigned to each device of both networks.

(5) Answer the questions by considering the program below.

```
def amoutClac(item_no):
   'Calculate sale amount of item'
   fo3=open('sales.txt')
   data1=fo3.readline()
   item_amount=[]
   while(data1):
      data3=data1.strip().split("\t")
      if item_no==data3[0]:
         item_amount.append(int(data3[2]))
      data1=fo3.readline()
   fo3.close()
   return(sum(item_amount))

fo=open('confec.txt')
line=fo.readline()
head=line
item_no=input("Please Enter Item Number : ")
while (line):
    line=fo.readline()
    data=line.strip().split("\t")
    if data[0]==item_no:
       avb_amount=int(data[2])-amoutClac(data[0])
       if avb_amount>0:
          print("The Item '%s' is found..!! Available Amount is %d"%(data[1],avb_amount))
          amu=int(input("Please Enter the amount : "))
          fo2=open('sales.txt','a')
          if amu<=sale_amount:
             outstr=("%s\t%s\t%s\t%f\n"%(data[0],data[1],amu,(amu*(float(data[3])))))
             fo2.write(outstr)
             print("Successfuly Updated a Record..!")
          else:
             print("Sorry... Unavailable Amount...!")
          fo2.close()
       else:
          print("Available only --> %d"%avb_amount)
          break
```

The above program is used to record daily transaction of a confecting house. Lists of details of confecting are saved as "**confec.txt**".

| Item_no | Item | Amount | Unit_Price |
|---|---|---|---|
| 1003 | Chewing_gum | 150 | 5.00 |
| 1004 | Toffee | 200 | 2.00 |
| 1005 | Chocolate | 100 | 10.00 |
| 1006 | Jelly | 200 | 5.00 |
| 1007 | Candy_bar | 100 | 6.00 |

Today's transactions of the confecting house is saved as "**sales.txt**" .

| Item_no | Item | Amount | Collection |
|---|---|---|---|
| 1004 | Toffee | 12 | 24.00 |
| 1004 | Toffee | 8 | 16.00 |
| 1005 | Chocolate | 20 | 200.00 |
| 1006 | Jelly | 14 | 70.00 |
| 1003 | Chewing_gum | 16 | 80.00 |
| 1003 | Chewing_gum | 4 | 20.00 |
| 1007 | Candy_bar | 100 | 600.00 |

(a) **What is the statement that refers to "Calculate sale amount of item" in the function amoutClac() ?** State the function of it.

(b) Name three (3) tasks executed by the command **avb_amount=int(data[2])-amoutClac(data[0])** in the program.

(c) Briefly explain the function of **amoutClac().(At least 3 main functions need to be included.)**

(d) Answer the following questions by considering the above files "sales.txt" and "confec.txt".

(i) What would be the output for the item number 1007 given by the user.

(ii) What would be the output for the item number 1005 and the amount 120 given by the user.

(iii) What would be the output for the item number 1004 and the amount 120 given by the user.

(e) Considering the **function** in the program, write new function as "**dailyCollection**" to display the sum of daily collections. Daily collection information can be taken from "Collection" column in "sales txt" file.

(6).

(a) Using an example for each category explain the 3 types of e-businesses.

(i) B2B (Business to Business)

(ii) B2C (Business to Consumer)

(iii) G2C (Government to Consumer)

(b) Minoli & Tom lives in two different countries. Minoli wants to buy an i-phone used by Tom through a payment gateway. Being an ICT student, suggest the most suitable business type, they can be used for this purpose with reasons.

(i) In the domain of agent technology explain the term "Multi Agent"

(ii) Give two main characteristic of a Multi Agent System.

(iii) Give an example where Multi Agent Technology could be used.

.