



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 °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 °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 °C.	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 Karnaugh 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?

```
<p>Thithhawella Tank</p>
```

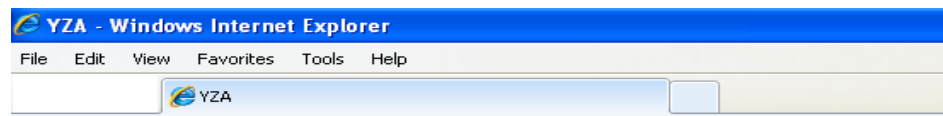
```
<p>Thithhawella tank is located in the North Western Province</p>
```

```
<hr>
```

```
<p>Birds</p>
```

```
<p>Forty two bird species were observed at the tank</p>
```

(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, should link to the sites “<http://www.yza.com>”, “<http://www.Kturtle.com>” respectively.



Turtles are in danger!



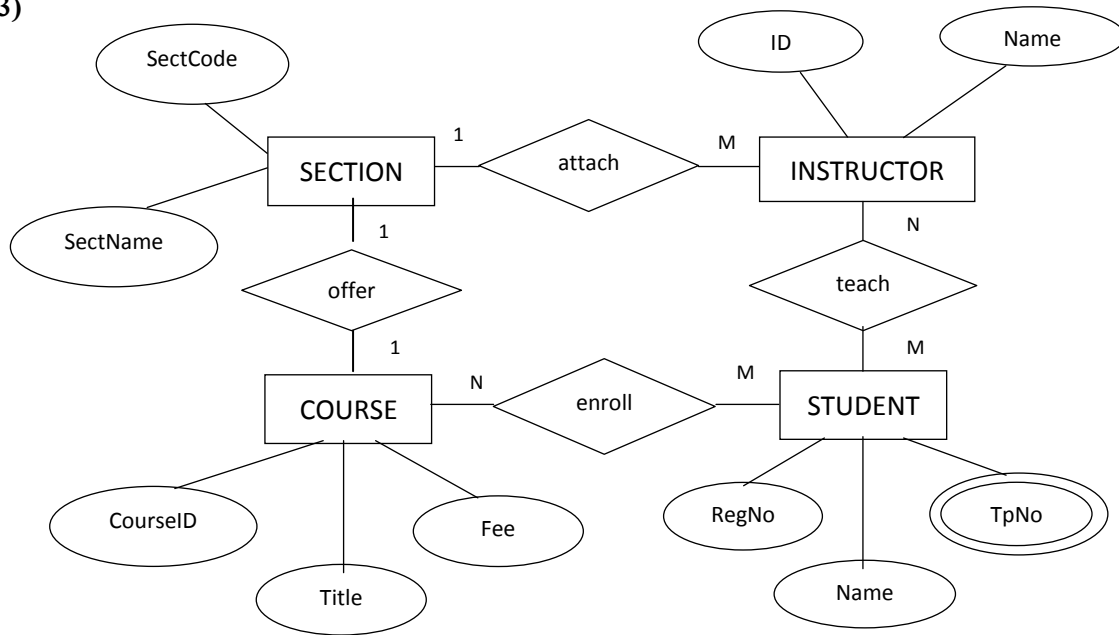
Let's save turtles by refusing:

- Turtle eggs
- Turtle soup
- Ornaments made by turtles

More Details:

[Young zoologists Association](#)
[Kosgoda turtle hachery](#)

(3)



Consider the ER diagram related to an Educational Institute.

- Name the entities given here and state the relationship among the entities.
- Classify all the relationship in the above ER Diagram as One to One, One to Many and Many to Many. Justify your answer.
- Name the multi-valued attribute in the above diagram and What are the special characteristics of multi-valued attributes given in the above diagram?
- What are the suitable attributes for a unique key?
- Name two Composite attributes which can be added to the Name field.
- 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 are 192.168.10.65 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("Successfully 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 confectioning house. Lists of details of confectioning 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 confectioning 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 `amountClac()` ? State the function of it.**
- (b) **Name three (3) tasks executed by the command `avb_amount=int(data[2])-amountClac(data[0])` in the program.**
- (c) **Briefly explain the function of `amountClac()`.(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.