

සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව

Sabaragamuwa Provincial Department of Education

තෙවන වාර පරීක්ෂණය - 2018

13 ශ්‍රේණිය

Third Term Test – 2018

Grade 13

තොරතුරු හා සන්නිවේදන තාක්ෂණය I

පැය දෙකයි

Information and Communication Technology I

Two hours

Index no:

Answer all the questions.

01. Which of the following is a characteristic of 4th generation computers?

- I. Having processors with very large integrated circuits.
- II. Beginning to use mouse.
- III. Provide PDP as an example.
- IV. Based of Artificial intelligence.
- V. Using many transistors.

02..... is not a data validity check;

- I. Type check
- II. Format check
- III. Double entry check
- IV. Range check
- V. Length check

03. What is the octal equivalent of 1110.01101_2 ?

- I. 61.32_8
- II. 14.32_8
- III. 32.16_8
- IV. 16.32_8
- v. 14.64_8

04. Which of the given is the twos complement of decimal number 51?

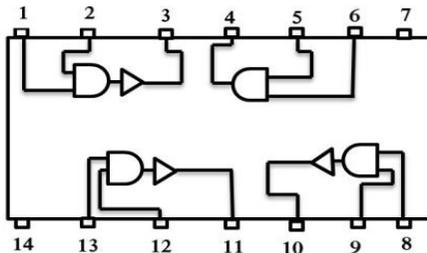
- I. 11001101_2
- II. 00110010_2
- III. 00110011_2
- IV. 11001111_2
- V. 101100111_2

05. $12_8 \times 7_8 = ?$

- I. 106_{10}
- II. 601_{10}
- III. 106_8
- IV. 601_8
- V. 611_8

06. The simplified solution of the Boolean expression $F = X\bar{Y}Z + \bar{X}YZ + XYZ$ is;
- | | | |
|------------------|-----------------|------------|
| I. $Z + (X + Y)$ | III. ZY | V. $X + Y$ |
| II. $Z(X + Y)$ | IV. $Y + (X.Z)$ | |

07. Consider following circuit.



Which of the following is incorrect regarding 4,5,6 leads of above circuit?

- | | |
|--|---|
| I. When lead 6 =1 and lead 5=0, lead 4=0 | IV. When lead 6 =0 and lead 5=0, lead 4=0 |
| II. When lead 6 =0 and lead 5=1, lead 4=0 | V. When lead 6 =1 and lead 5=1, lead 4=1 |
| III. When lead 6 =1 and lead 5=0, lead 4=1 | |
08. Which of the following doesn't represent $Q = \bar{P}\bar{Q} + P\bar{Q}\bar{R} + \bar{P}\bar{Q}R$?
- | | |
|---|---------------------------------------|
| I. $Q = \bar{P}\bar{Q} + P\bar{Q}\bar{R}$ | IV. $Q = P(P\bar{Q} + \bar{Q}R)$ |
| II. $Q = \bar{P}\bar{Q}(\bar{Q} + \bar{R})$ | V. $Q = P(P\bar{Q} + \bar{Q}\bar{R})$ |
| III. $Q = \bar{Q}(\bar{P} + P\bar{R})$ | |

09. The task of BIOS during the booting up process of the PC is;

- | | | |
|--|------------------|-------------------|
| A- Check the accuracy of the power supply | | |
| B- Bringing the OS to main memory. | | |
| C- Check the functionality of basic hardware | | |
| D- Reading instructions stored in CMOS | | |
| I. A only | III. C only | V. B,C and D only |
| II. A and C only | IV. C and D only | |

10. is a component of CPU.

- | | |
|----------|---------------------|
| I. ROM | IV. L3 Cache memory |
| II. RAM | V. Main memory |
| III. ALU | |

11. Which of the following is not a type of scanner?

- I. MICR
- II. OMR
- III. OCR
- IV. Digitalizer
- V. Barcode Reader

12. A running state process will transit to blocked state due to.....

- I. Timeout
- II. I/O waiting
- III. dispatch
- IV. Swapping
- V. Temporary stop

13. Consider following statements.

A- Any OS can run on any processor

B- An OS is designed and developed for a special group of processors.

Which of the following is correct regarding above statements?

- I. Both A and B is true.
- II. A is false but B is true.
- III. A is true but B is false.
- IV. Both A and B is false.
- V. B is true and A is acceptable.



14. form the data transmitted to the network as suitable data structures relevant to adjacent layer.,

- I. Presentation layer
- II. Application layer
- III. Session layer
- IV. Transport layer
- V. Network layer

15. Which of the following is an incorrect statement about logical address and physical address?.

- I. The logical address is assigned by a software but physical address is a fixed number.
- II. The physical address consists of two parts. One part manufacturer number and the other is NIC number.
- III. The physical address is stored in a memory chip of NIC card..
- IV. Two computers cannot have same physical address.
- V. One physical address is available for one or more PCs.

16. An outsider is trying to steal username and password which can be used to access an information system. What type of threat does this action belong?

- I. Spoofing
- II. Elevation of privilege
- III. Reputation
- IV. Port Scan
- V. Phishing

17. White hat hacker is a;

- I. Person who access network unauthorized manner and steal data
- II. Authorized person who can be assigned to check security of a network.
- III. Person who steal data by directly accessing to PC..
- IV. Person who steal and sell data.
- V. Person who use a device to maintain the network.

18. Which topology can be formed by using only one hub or a switch?

- I. Star
- II. Bus
- III. Hybrid
- IV. Ring
- V. Tree

19. Which of the following consists application layer protocols of OSI 7 layer model?

- I. HTTP,HTTPS,FTP,RPC,UDP
- II. RPC,HTTP
- III. HTTP,TCP,UDP
- IV. HTTP,TCP,UDP,TELNET,SMTP,POP3,SNMP
- V. HTTP,HTTPS,FTP,TELNET,SMTP,SNMP

20. If the subnet mask of a class B network is 255.255.255.224 . How many computers are available in a single subnet ?

- I. 8
- II. 30
- III. 64
- IV. 62
- V. 126

21. What is the subnet mask of a Class C network which should be divided into at least 5 subnets which consist 16 computers within a single subnet?

- I. 255.255.255.0
- II. 255.255.255.224
- III. 255.255.255.192
- IV. 255.255.255.248
- V. 255.255.255.64

22. If the network address is given as 172.16.0.0/19, How many subnets and Hosts can be connected?.

- I. 07 subnets and 30 computers to each subnet.
- II. 08 subnets and 8190 computers to each subnet.
- III. 08 subnets and 2046 computers to each subnet.
- IV. 07 subnets and 2046 computers to each subnet.
- V. 08 subnets and 30 computers to each subnet.

23. Which of the following is not a valid subnet mask?

- I. 255.255.255.0
- II. 255.255.255.192
- III. 0.255.255.128
- IV. 255.255.255.248
- V. 255.255.0.0

24. Which of the following statements describes a functional requirement of a digital camera?

- I. Should be light in weight
- II. Shall be able to provide one year warranty for battery
- III. Should provide a USB cable
- IV. Shall to able to take a photo
- V. Should have a memory card with sufficient capacity.

25. What is the correct SQL code to retrieve Registration number, Student's name, Course and academic year ?

- I. Select S.Register No, S.Student Name, C.course, R.Academic Year
From Student S, Couse C, Register R
WHERE S. coursed = R.Courseid
- II. SELECT Register No, Student Name, Course, Academic Year
FROM Student, course
WHERE Register No = Courseid
- III. SELECT S. Register No, S.Student Name, C,course R.Academic Year
FROM Student S, course C,Register R
WHERE s.courseid = R.courseid AND S.Courseid = C.courseid
- IV. SELECT S.Register No, S,student Name, C.course, R.Academic Year
From student S.course c,Register R

WHERE s.courseid = R.courseid or s.courseid =c.courseid

V. SELECT S. Register No, s.student Name, C.course, R.Academic Year
FROM student S,Register R,course c
WHERE S.courseid =C.courseid

?

26. A university has designed a database which store students admission number (ADNO), Student name (stName), National ID Card number (NIC), Course name (course), Course name (courseid) and lecturer's name (lecturer). Which of the following is/are relational schema/s relevant to above database is in 2NF ?

- A . Student (ADNO, stName, NIC, courseid)
Course (courseid, course)
- B . Student (ADNO, stName, NIC, courseid, course)
Course (courseid, lecturer)
- C . Student (ADNO, stName, NIC)
Course (courseid, course)

- I. A only.
- II. B only.
- III. C only.
- IV. A and B only.
- V. B and C only

27. Which of the following systems depend on AI?

- A – Expert Systems
- B – Enterprise Resource Planning Systems
- C – Multi agent Systems
- D – Geospatial Information Systems

- I. A and B only.
- II. A and D only.
- III. C and D only.
- IV. A and C only.
- V. B and D only.

28. Consider following components

- A. Graphs
- B. Maps
- C. Animations
- D. Text

Which of the above can be found in a web page?

- I. A,B,C only.
- II. A,B only.
- III. A,C only.
- IV. A,D only.
- V. A,B,C,D only.

29. What is the correct tag to insert a form to a HTML document?

- I. <f> II. <input> III. <p> IV. <form> V. <forms>

30. Consider following HTML code.

```
<html>
  <head>
    <title>countries</title>
  </head>
  <body>
    <p><!--<h1> sri lanka</h1>- -></p>
  </body>
</html>
```

What will be the output if this code is rendered?

- I. “ sri lanka “ will be displayed in the title bar and “ country “ in header.
II. “ country” will be displayed in the title bar.
III. “ sri lanka“ will be displayed in the title bar.
IV. <p> <!-- <hi> sri lanka </hi> </p> will be displayed in the body of the page.
V. There will be no outputs

31. Consider following output segment of a HTML form.

First name

What is the correct code which can be used to get above output?

- I. First name <input type = “ submit” value = “ submit” >
II. <input type = “text” name = “textbox1”>
III. <input type = “text” name = “first name”>
IV. <input type = “box” name = “first name”>
V. First name <input type = “ text” name = “ text” >

32. What is the correct output of following code segment?

```
<h1>Type of Memory</h1>
<dl>
  <dt>RAM</dt>
  <dd>Random access memory </dd>
  <dt>ROM </dt>
  <dd> Read only memory</dd>
</dl>
```

i

Type of memory Ram Random access memory ROM Read only memory
--

ii

Type of memory Ram Random access memory ROM

iii

Type of memory Ram Random access memory ROM

iv

Type of memory Ram Random access memory ROM Read only memory
--

v

Type of memory Ram 2. Randr access memory ROM 2.Read only memory
--

33. Which of the following python code segment is syntactically correct?

I. total = 0
for i in range(1 : 12):
total = total + i

III.
total = 0
for i in range(1 : 12):
total = total + i

V.
total = 0
for i in range(1 : 12)
total = total + i

II total = 0;
for i in range(1 : 12):
total = total + i

IV.
total = 0
for i in range(1 : 12)
total = total + I;

34. What is the correct html code segment to get following output?

1	
2	3
	4

I) <table border =“/td”
 <tr><td colspan“2”</td>
 </tr><tr>
 <td row span “2”</td>
 <td>3</td>
 </tr><tr>
 <td>4</td>
 </tr></table>

II) <table border =“1”
 <tr>
 <tr><td colspan“2”>1<</td>
 </tr><tr>
 <td row span “2”>2</td>
 <tr>< th >3</th>
 <th>4</th>
 <tr></talbe>

III) <table border =“1”>
 <tr><td colspan=“2”.1</td>
 </tr><tr>
 <td rowspan=“2”>2</td>
 <td>3</td>
 <td>4</td>
 </tr></table>

IV) <table border =“1”
 <tr>
 <tr><td colspan= “2”>1</td>
 </tr><tr>
 <td rowspan “2”>2</td>
 </tr><tr>
 <td > 3 </td> </tr>
 <tr>
 <td>4 </td></tr>
 </table>

V) <table border =“1”
 <tr><td colspan“2”>1<</td>
 <tr> 2 <th>
 <tr> <tr>
 <th> 3 </th>
 </tr> clhdh>
 </tr> < tr>
 <th> 4 </th> </tr>
 </table>

35. What is the correct output of given code segment?

```
<ol type =“A ”>
<li> name </li>
<ul type = “square ”>
<li> Saman </li>
<li>Kamal </li>
</ol><ul type=”square”>
<li> Rathnapura </li>
<li> Kuruwita </li>
</ol> </ul>
```

(1) 1 Name

- Saman
- Kamal

2 City

- Rathnapura
- Kuruwita

(2) 1 Name

Saman
kamal

2 City

Rathnapura
Kuruwita

3) A Name

Saman
Kamal

B City

Rathnapura
Kuruwita

(4) A Name

- Saman
- Kamal

B. City

- Rathnapura
- Kuruwita

(5) A. Name

Saman
Kamal

B. City

Rathnapura
Kuruwita

36. < a href = “sabaragamuwa.html ” target =“-blank ”>

Sabaragamuwa

The above code displays the web page “sabaragamuwa.html” in;

- I. Same window
- II. Same frame
- III. New window
- IV. A frame called “-blank ”
- V. A window called “-blank ”

37. Consider following CSS code

```
h2 {color:green;}
```

Which answer shows the types of h2, color, green in correct sequence ?

- I. Selector, Valve, Property
- II. Property, Valve, Selector
- III. Selector , Property , Valve
- IV. Valve, Property, Selector
- V. Valve, Selector, Property

38. What is the output of following python code?

```
data = [25, 28, 30, 40, 85, 92, 73]
```

```
for i in data:
```

```
    if i >= 40:
```

```
        print(i, end=",")
```

- I. 25, 40, 85, 92, 73
- II. 40, 85, 92, 73
- III. 73, 92, 85,
- IV. 28, 30, 85, 92
- V. 25, 28, 30, 40, 85, 92, 73



39. Which of the following is a part of an expert system?

- I. Search engine
- II. Knowledge base
- III. Software agent
- IV. Agent system
- V. Swarm intelligent agent

40. What is the e-commerce type of a web page which facilitate customer feedback services to organization?

- I. B2B
- II. B2C
- III. C2B
- IV. B2G
- V. E2B

41. Some films use computer applications instead of people, animals and devices.

This scenario is an example for

- I. Expert system
- II. Software agent system
- III. Artificial intelligence
- IV. Ubiquitous computing
- V. Neural networks

42. Which of the following statements is correct regarding open and close status of a system?

- I. A bank ATM machine should be a closed system.
- II. A general purpose computer can be considered as an open system.
- III. Human blood circularly system is an open system.
- IV. Mobile phone is a closed system.
- V. Solar power system is a closed system.

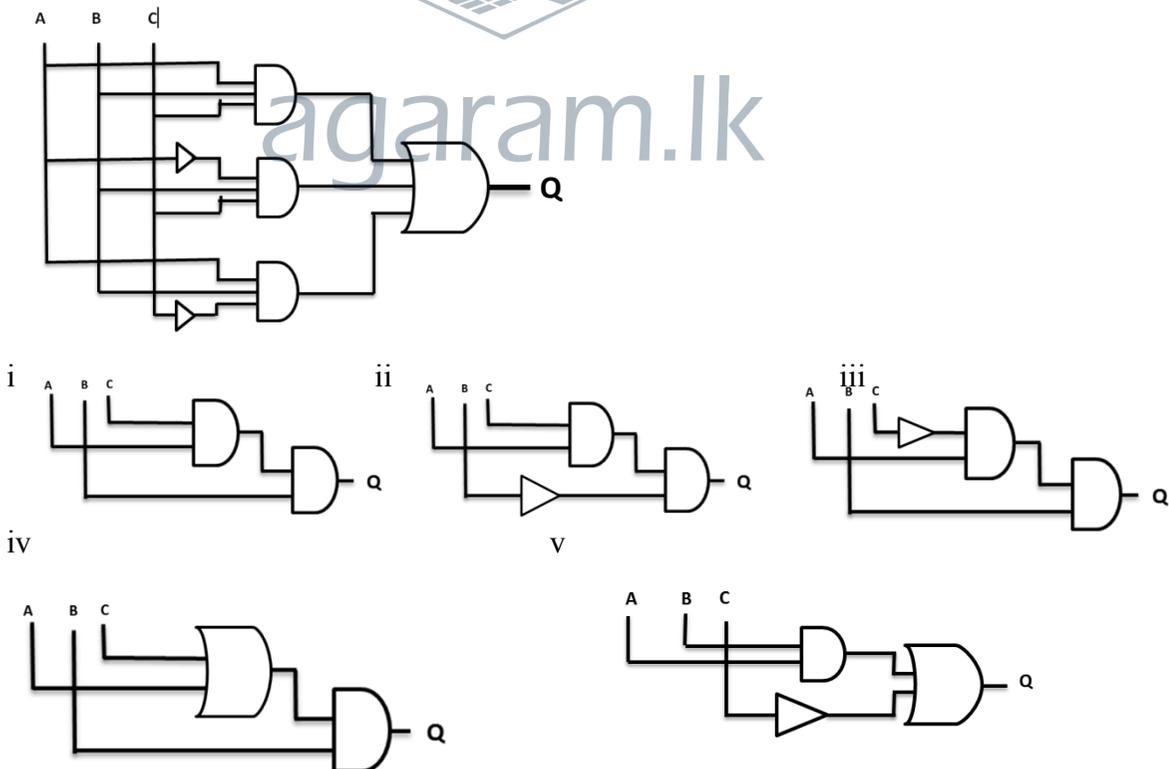
43. Consider following statements about databases.

- A- Computer database management needs human resources than a manual system
- B- Data storing is more efficient than a manual system
- C- Minimized errors in data storing
- D- Data duplication and redundancy exists.

Which of the above are true regarding a carefully designed database?

- I. A and B only
- II. A and D only
- III. B and C only
- IV. B and D only
- V. C and D only

44. Which small circuit shows the same functionality of the given circuit?



45. What is the task of SMTP ?

- I. To send an e-mail
- II. To prepare an e-mail address
- III. To transmit a page with in a web server to client pc
- IV. To secure transmission of a web page within a network
- V. None of given

46. What is the output of following python code ?

```
a = 3
b = 8
def max(a,b):
    if a > b:
        return a
    else:
        return b
print(max(9,7))
print(b)
```

- I. 9 7 II. 7 9 III. 9 8 IV. 8 9 V. 9 8 3



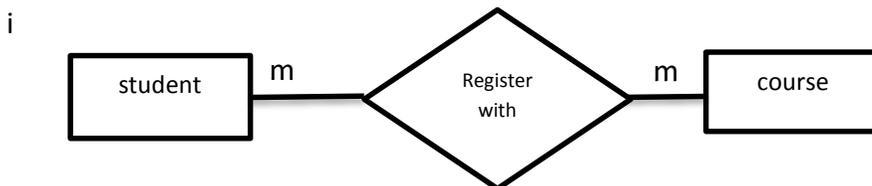
47. Consider following relational schemas

- Student(registrationNo, Name, CourseId)
- Course(courseId,course)
- Register (Academic_year, Due_date, RegistrationNumber,CourseId)

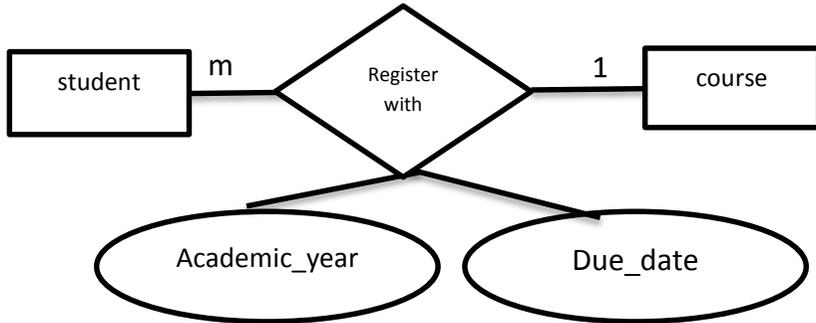
Here the RegistrationNumber, CourseId are uniques numbers of relations student and course respectively. What will be the correct primary key for Register relation?

- I. Academic_year
- II. CourseId
- III. Acedemic_year,RegistrationNumber
- IV. RegistrationNumber, CourseId
- V. Acedemic_year, Course Id

48. Which of the following is the correct ER to represent above schema?



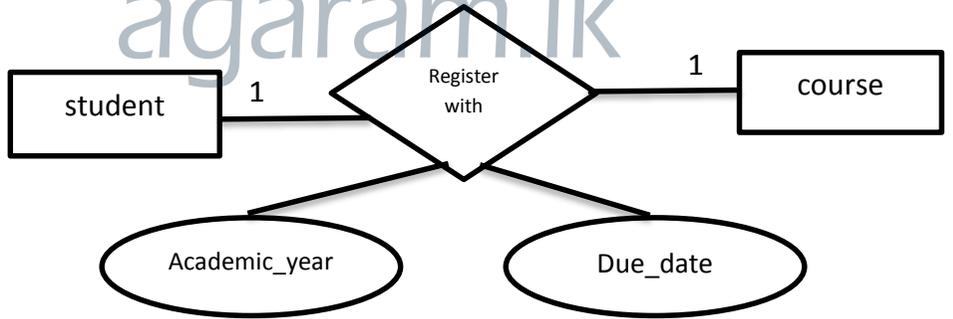
ii



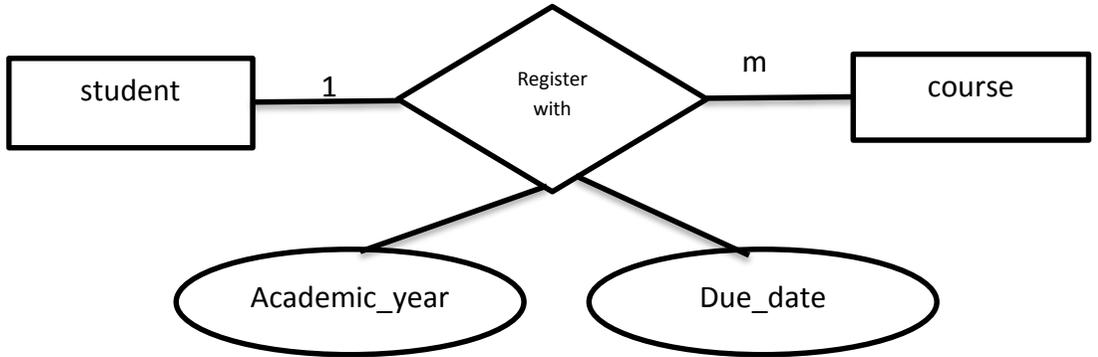
iii



iv



v



49. Consider following python data

8.9, ['Nimal', 55, 'male'], ('abc', 45), {1: 'name', 2: '0719501212'}

The data types in correct sequence are;

1. int, list, tuple, dictionary
2. float, tuple, list, dictionary
3. float, list, tuple, dictionary
4. string, array, tuple, list
5. float, array, list, dictionary

50. if python variables are assigned as a = 13, b = 2.5, c = 3. What is the output of python expression $a \% 3 * c + 10 / b$?

I. 5.2

II. 7.0

III. 13.0

IV. 16.5

V. 51



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Sabaragamuwa Provincial Department of Education

තෙවන වාර පරීක්ෂණය - 2018

13 ශ්‍රේණිය

Third Term Test – 2018

Grade 13

තොරතුරු හා සන්නිවේදන තාක්ෂණය II

පැය තුනයි.

Information and Communication Technology II

Three hours

Index no:

Part A

Answer all questions on this paper itself.

01. Complete following HTML Code

Sabaragamuwa Sri Lanka

sab.jpg

This is the official portal of the Sabaragamuwa provincial council. The objective behind the portal is to provide one interface for citizens and other stake holders.

Districts in Sabaragamuwa

District	Population
1. Ratanapura	1027500
2. kegalle	9,37201

User name

Password

Consider the name of the photo as "sab.jpg".

```

<html>
<head>
<title>Sabaragamuwa</title>
<.....1.....>
<.....2.....>
<h1><.....3....>Sabaragamuwa Sri Lanka</b><....4....>

<p> This is the official portal of the <.....6....>Sabaragamuwa provincial council.</b><br> The
objective behind the portal is to <br>provide one interface for citizens and other stake
holders.<.....7....>
<.....8....>Districts in Sabaragamuwa<...9....>
<...10... border="1">
<tr><.....11....>District<...12...><...11...>Population<...12...></tr>
<...13....><td><ol>
<li>Ratanapura</li>
<li>kegalle</li>
</ol></td>
<td>
<li>.....14.....</li>
<li>9,37201</li>
</td>
</tr>
</table>
<.....15.... width= 50% Align = left>
<form action="sb.php" name="form" ..16.....="get">
User name <input type= .....17... name="txt1"><br>
.....18..... <input type= .....19.....name="txt2"><br>
<input type = "button" value = "Log in">
<input type = "button" value = ".....20....">
<input type = "button" value = "Clear">
</form>
</body>
</html>

```



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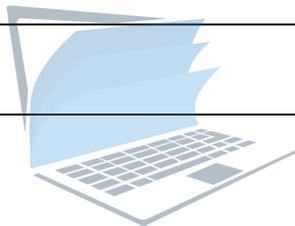
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

02(a) I. Briefly explain following e-business types

(a) Brick and click

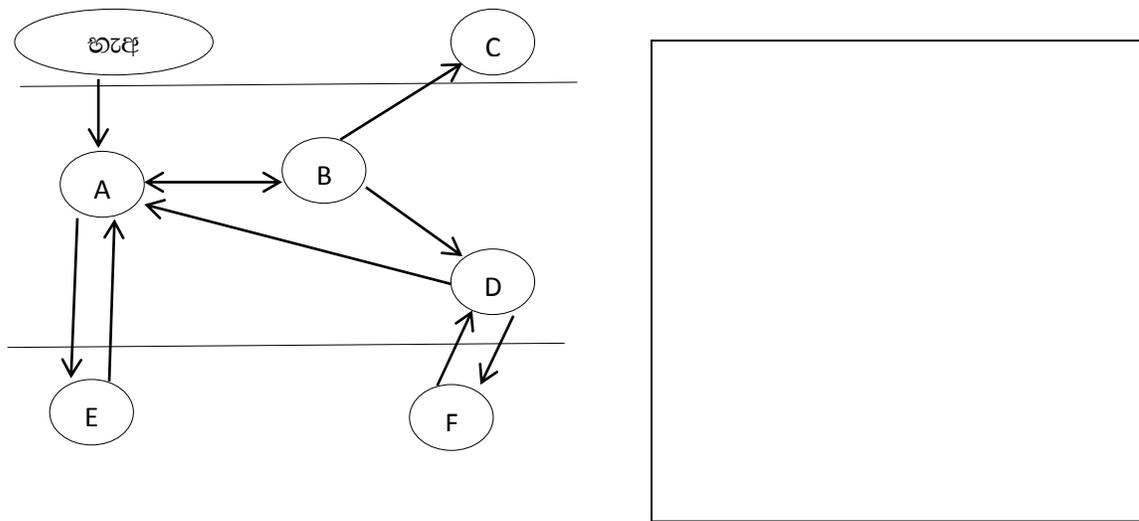
(b) Pure click



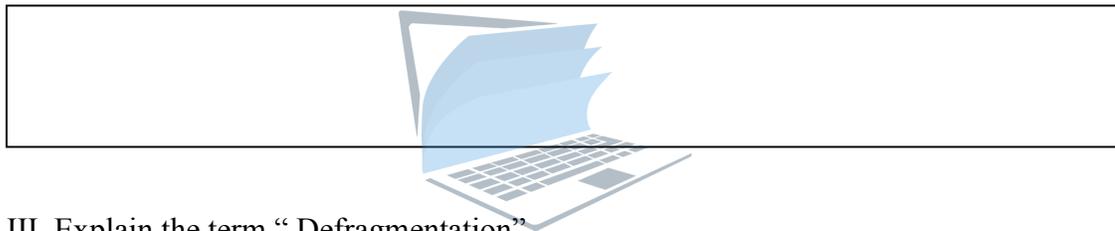
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II. Write three key conditions to be satisfied in order to classify a transaction/service between two persons as C2C in e-commerce.

(b) I. Name A, B,C,D,E and F states of following seven state process transition diagram in process management carried out by operating system.



II. Explain the reasons to transit as $B \rightarrow A$ and $B \rightarrow D$

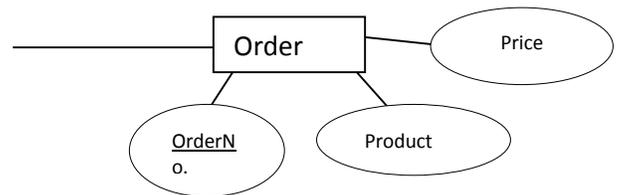
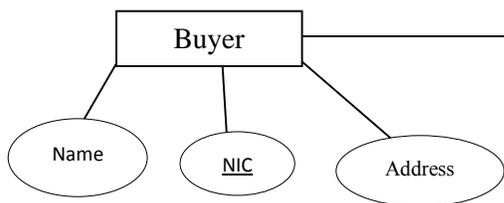


III. Explain the term “ Defragmentation”



03. A website called eshopping.com facilitates to companies which sell their products online by allowing customers to purchase online. Customers or buyers can place orders in this site. One buyer can place several orders and on one order always belong to a single customer.

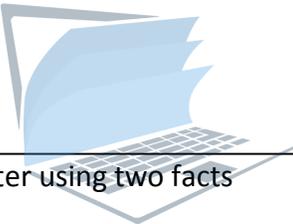
a) Given below is a part of ERD diagram of above online system. Complete it.



I. Write the relational schema for above completed diagram

II. Write SQL code to create Buyer table.

b) Write a functional requirement and two non-functional requirements of this online system.



04. a) Compare compiler and Interpreter using two facts

	Compiler	Interpreter
1		
2		

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b) Following python code has errors, rewrite the correct code.

```
def  sorting-list (x)
    for k in ranges (len(x)-1,0,1):
        for i in ranges(k):
            If x[i]>x[i+1]}:
                temp==x(i)
                x[i]=x[i+1]
                x[i+1]=emp
print(x)
sorting-list([3,5,4,1,2,-6])
```

Part B

Answer 04 questions only.

01. Consider an automatic system which is designed for a university to destroy its garbage by burning. Its functionality can be described as follows;

The main functions of the system are operated on sensor inputs. Sensors are used to monitor the condition of garbage door (which used to insert garbage to the system), fuel supply and generating sufficient flame. The status of these inputs are given in two states. The open and close status of the garbage door is represented using Boolean values 0 and 1 respectively. The open and close status of the fuel valve is represented by 1 and 0 respectively. The temperature of the flame is measured by predefined value and if the flame temperature is high or low than the predefined value it will be represented using 1 and 0 respectively.

System will be automatically turned off if the garbage door is open as a safety precaution and doesn't turn on even though the other conditions are active. And also system will be automatically turned on or off if the fuel valve is open or close respectively. Also the system will be automatically turned on or off if the temperature of the flame is higher or lower than the predefined value. The active and inactive status of the system is represented using Boolean values 1 and 0 respectively. *Assume that the electricity is always supplied to the system.*

- a) Construct the simplest logic circuit using only NAND gates to control the system. Clearly show truth table, Boolean expression and Boolean algebraic rules used for simplification.
- b) One of the observers of the system had criticized it saying, "The system will be active even though there is no fuel to burn". Do you agree with this statement? Justify your answer.

02. A company has decided to modify its computer network to improve its efficiency by applying following conditions.

The main network has been assigned a public IP address range 192.168.1.0 with subnet mask 255.255.255.192. It contains a Mail Server, Web Server and another server to connect subnets to internet as well as reduce the traffic on internet connection. It has eight additional subnets for internal use having the private IP address range 172.16.0.0 with the subnet mask 255.255.0.0. Computers in each subnet can access resources in all other subnets. There is also an application server for the use of internal clients.

Identify device required to establish the network and draw a network diagram to show the logical arrangement of the organization's computer network. Show all parts of the network with appropriate IP addresses. Clearly show all calculations stating assumptions you made.

Further explain the necessity of a firewall for this type of network and mention where it should be connected.

03. Consider following description to answer questions.

An online system was introduced to manage polythene based waste in developing countries. This system use sensor network to identify polythene waste can locations, its filled limit and notify to the nearest employee to remove it. An online form is used to get public feedback about this system aiming to improve its quality. Biometrics are used to monitor the attendance of the employees and the Ministry of Environment maintain online services from ABC company to acquire information about polluted areas of the region through their survey.

- a) What is the e-commerce transaction type of online public feedback process? Justify your answer.
- b) Which e-commerce transaction type is described by the process of providing information about polluted areas? Justify your answer.
- c) State a limitation which may arise in implementing this type of system in Sri Lanka.
- d) One of the clients of the system commented that this system shows the characteristics of an Agent System. Do you agree with this comment? Justify your answer.
- e) Name two biometric inputs for Employee monitoring sub system.

04. The management of an organization has decided to pay its employee's telephone bills. This process was easy because all of them get their communication services from the same telecommunication company. The company doesn't charge for first 100 units except the rental of Rs.320.00. And it charge Rs.2.75 to each unit for next 50 units. Every additional unit which exceed this limit will charge Rs.5.00 each. Assuming that the company provide information about used units of each and every employee answer following questions;

- a) Construct an algorithm represented by a flowchart which may output the telephone bill of an employee. *Clearly state the assumptions (if any) made.*
- b) Write the Python code for the solution represented in (a)
- c) Write the python function to insert information of used units and telephone bill to the file named "bill.txt"

05. Construct an ER diagram for given scenario. Clearly represent entities, attributes and primary keys within the diagram.

Sabaragamuwa Provincial Department of Education is designing an Electronic Library System (ELS) aiming to improve knowledge and promote reading habit of students. To get e-books from ELS students should get its membership by registering with the system providing their name, grade and school. After this process a member is given a unique memberID, Username and a password to access. For the process of inputting an e-book is to the system details like unique ISBN, book name and author's name is required. One member can view three e-books at one instance on his web browser and a single e-book can be shared among multiple users at one instance.

The system take notes about the number of books viewed by each and every member and provide grades accordingly. The system will also facilitate to generate a report containing list of members which acquire each grade which has to be submitted to its management.

06. Consider the following description about a Sales System and draw a Level 1 DFD to represent its functionality. *Clearly state assumptions you have made (if any).*

This company consists of four sections named Sales, Warehouse, Finance and Dispatch which perform functions Managing customer inquiries, Stock management, Handling payments and delivering orders respectively. When a customer initially contact Sales department and place the order. The Sales department checks the availability of items using the Stock file and if items are not available, inform it and also provide options. If available it place the new order in orders file. New orders are taken from the order file by warehouse department to parcel required order and also save its details as a completed order in the completed order file. Then the warehouse balance the stock and send updated stock details in stock file. After this process the Dispatch department take the completed order details from relevant file and prepare a delivery note which should be sent to the customer and also drop a copy to delivery file. Finally Finance department create an invoice to the delivery note and send it to the customer. After the customer made the payment the finance will pass the receipt for the payment, delivery note and the parcel to the customer.



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