



Second Term Test - Grade 13 - 2019

Index No : Information and Communication Technology I Two - Hours

Instructions :

- Answer all the Questions
- Write down your index number in the space provided in the answer sheet.
- Select the correct or most appropriate answer from the given answers of 1,2,3,4 or 5

01. An error message was displayed and the data entered was rejected by a software used for entering test marks when the mark entered was higher than 100. The cause for this incident may be,

1. It contains a Type Check function for marks
2. It contains a Range Check function for marks
3. It contains a Presence Check function for marks
4. It contains a Type Check and Presence Check function
5. Inserting data without a presence check

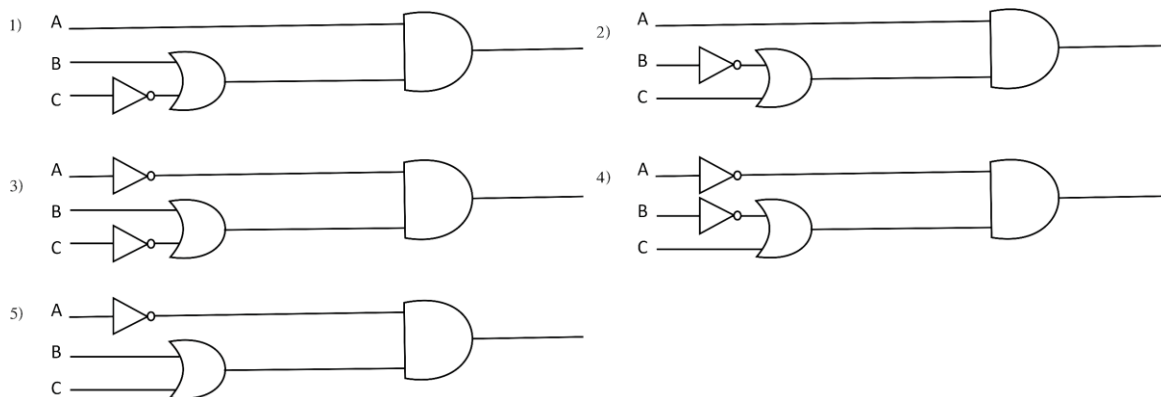
02 The octal equivalent of $F4_{16}$ is,

1. 363_8
2. 354_8
3. 254_8
4. 364_8
5. 265_8

03 Consider the Boolean expressions given below

$$Z = ABC + AB'(A'C')$$

In which circuit from followings the output will be equal to the given Boolean expression?



- 04 From which given expressions the Sum and Carry of the Half Adder circuit will be returned respectively for A and B Boolean variables.
1. From A OR B and A AND B
 2. from A AND B and A OR B
 3. from A XOR B and A OR B
 4. from A XOR B and A AND B
 5. from A AND B and A XOR B
- 05 In which expression given below, the output will be equal to the output values of A+B Boolean expression?
1. $AB + BB' + AA'$
 2. $AB + AB' + A'B$
 3. $AB + AB + A'B'$
 4. $AB + A'B' + A'B$
 5. None of above
- 06 Examine following statements
- A. Supports Unicode coding system
 - B. File allocation table and root directory exist at a fixed location.
 - C. Support for large hard disks.
- What are the correct expressions with regard to New Technology File System (NTFS) from above expressions?
1. Only A
 2. Only A and B
 3. Only B and C
 4. Only A and C
 5. A, B and C all
- 07 Types of processes are,
1. Input output bound processes, processor bound processes
 2. Input output bound processes, register processes
 3. User Bound processes, storage processes
 4. Processor bound processes, register processes
 5. Storage processes, register processes
- 08 When does an Operating System reclaim all resources assigned into a process?
1. Creating a process
 2. Process termination
 3. Interrupts occur
 4. Swapping processes
 5. Blocking processes
09. The processes are sent to the ready queue in the main memory by,
1. Short term scheduling
 2. Mid term scheduling
 3. Long term scheduling
 4. Multi level scheduling
 5. Task scheduling
10. The time a process spends in the ready queue for its turn to get on to the CPU is called,
1. Turnaround time
 2. Waiting time
 3. Response time
 4. Blocked time
 5. Ready time
- 11 Select the Subnet Mask of the network which contains 169.23.54.2/23 Network address
1. 255.255.255.0
 2. 255.255.255.224
 3. 255.255.255.254
 4. 255.255.254.0
 5. 255.254.254.0
- 12 A protocol which is not used in application layer is,
1. FTP
 2. SMTP
 3. POP3
 4. ICMP
 5. HTTP
- 13 Select another IP address which belongs to the network 192.168.1.100/28
1. 192.168.1.55
 2. 192.168.1.80
 3. 192.168.1.97
 4. 192.168.1.134
 5. 192.168.1.212

- 14 Which is not an advantage of computer networking ?
 1. Centralized management 2. Possibility of entering outsiders
 3. Security of data 4. Sharing physical resources
 5. The speed of data file transferring
- 15 The approximate time taken to transfer a 1GB file between two computers in a computer network in which data transfer speed is 10mbps is,
 1. 16 seconds 2. 102 seconds 3. 2 minutes
 4. 8 minutes 5. 14 minutes
- 16 Which is not a feature of fiber optic cables ?
 1. Communicating data as analogue signals
 2. Data transfer rate is higher than all other media
 3. Data distortion does not occur from electromagnetic fields
 4. Higher bandwidth value
 5. Can transfer data in longer distances
- 17 Select the devices which cannot be used to connect two computer networks
 1. Layer Switch 2. Bridge 3. Modem 4. Router 5. Repeater
- 18 Study following expressions given about Session layer
 a. Connects the devices used in data communication
 b. Identify suitable routes for data transmission
 c. Identifies and formats data files
 d. Conduct data transmission and closing as required
 Select the answer that contains only true expressions
 1. Only a and b 2. Only b and c 3. Only c and d
 4. Only a and d 5. Only a , b and d
- 19 Select the answer which contains correct expressions related to an information system
 A. It is always computerized
 B. There is a particular boundary
 C. There are inputs, outputs, as well as processes
 D. There is a specific goal or goals
 1. A,B,C 2.B,C,D 3. A,C,D 4.A,B,D 5. A,B,C,D
- 20 Select the type of feasibility study which assesses the willingness and ability of the users to support and use the proposed system
 1. Operational feasibility 2. Economic feasibility 3. Organizational feasibility
 4. Application feasibility 5. Testing feasibility
- 21 This testing is done by obtaining data from the program itself in order to test the structure of the program. What is the type of this testing?
 1. Black box testing 2. Unit testing 3. Integration testing
 4. White box testing 5. Inner box testing

- 22 Internal acceptance testing is done by
1. A person who directly joined to develop the software in the company
 2. A person who did not directly joined to developed the software in the company
 3. A person who represents the client
 4. By a customer of the client who required software
 5. By the client who required the software
- 23 In a factory the attendance and departure of employees had been recording by maintaining a signing sheet. Later on a fingerprint reader has been installed and signing sheet also has been used along with fingerprint reader for few months. Which is the system implementation method used in this case?
1. Direct implementation
 2. Parallel implementation
 3. Pilot implementation
 4. phased implementation
 5. Online implementation

• **Use following descriptions and A, B,C,D, relations to answer the questions 24 and 25**

A principal in a national school needs a database to store students' admission of numbers, names, addresses, NIC numbers, and birth dates. Further, principal wants to know the marks obtained by a student for each subject. In addition, he wants to know the subjects assigned for teachers

Relations

- A. Student (admissionNo, studentName , address, DOB, NIC)
- B. Subject (subjectCode, subjectName)
- C. Mark (admissionNo, subjectCode, markObtained)
- D. Teacher (teacherNo, subjectCode, teacherName, subjectName, class)

- 24 What are the relations from above set exist in third normal form
1. Only A and C
 2. Only A and D
 3. Only A,B and C
 4. Only A,C and D
 5. Only B,C and D
- 25 Select the answer that mentions respectively the primary key set for Student, Subject, and Mark tables
1. admissionNo and NIC, subjectCode , admissionNo
 2. NIC, subjectCode, subjectCode
 3. admissionNo, subjectCode, subjectCode
 4. admissionNo, subjectCode, admissionNo and subjectCode
 5. admissionNo, subjectName, admissionNo and subjectName
- 26 Study the expressions given about ER diagrams
- A. An ER diagram contains entities and relationships
 - B. The cardinality of all entities should be always One to One
 - C. Entities may have attributes
 - D. They may have Binary and Ternary relationship
- What are the correct statements?
1. Only A and D
 2. Only B and C
 3. Only B and D
 4. Only A, C and D
 5. Only B, C and D
- 27 Which is the acceptable statement regarding relational databases?
1. The primary key of a table is selected from alternate keys
 2. The values of a foreign key cannot be duplicated
 3. A table cannot be created without a primary key
 4. A foreign key of a table should be a primary key of another table
 5. A table should have alternate keys

28 Consider following database operations

- A. Removing records from a Table
- B. Adding new data to a table
- C. Modifying data existing in a table
- D. Retrieving data from a Table

"To perform A,B,C,D, database operations..... expressions can be used respectively"

What is the answer suitable to fill the blank in about statement?

- 1.delete ,select , update and insert
- 2. delete , insert , select and update
- 3. select , delete , insert and update
- 4.insert , select ,delete and update
- 5. delete , insert , update and select

• Use following relations to answer the questions 29 and 30

programmer (programmerId , programmerName , gender , NIC , mobilePhoneNumber , degree , universityName)
client(clientId , clientName , address , telephoneNumber)
project (projectId , projectName , clientId , startDate , endDate , cost)
workFor(programmerId , projectId , startDate , endDate)

29 Consider the following statements

- A. On any instance, a programmer works in one project
- B. On any instance, a programmer work for only one client
- C. a client may have more than one project

Which statement/ statements can be considered as correct ?

- 1. Only A
- 2. Only B
- 3. Only C
- 4. Only A and B
- 5. Only B and C

30 Select the expression which is correct related to attributes of a relation

- 1. In the programmer relation, the attributes ; gender, NIC and mobilePhoneNumber, are candidate keys
- 2. startDate attribute is a derived attribute
- 3. NIC attribute in the programmer relation can be considered as an alternate key
- 4. startDate attribute in workFor relation is a foreign key
- 5. All records in workFor relation can be uniquely identified using projectId

31 Select the answer which contains the type of data structures of value = [50,76, 80] and value = (1,2,3)

- 1. Dictionary, List
- 2. List, Dictionary
- 3. Tuple , List
- 4. List , Tuple
- 5. Tuple , Dictionary

32 Select the option which appropriately mentions the answer suitable for filling blanks in following python codes

```
>>> A = 10
>>> B = 20
>>> print(B & C)
i .....
>>> print (B | C)
ii .....
>>>
```

- 1. 50 and 10
- 2. 30 and 20
- 3. 20 and 30
- 4. 50 and -10
- 5. 15 and 8

- 33 Select the answer that correctly mentions the output of following python code
 for i in range (2,8):
 print(i)
1. 3,4,5,6,7,8 2.. 2,3,4,5,6,7 3. 2,8 4. 2,2,2,2,2,2,2,2 5. 2,3,4,5,6,7,8

- 34 Select the Python code block written to find the area of a circle which executes without an error.

- | | |
|--|---|
| <p>1. Radius = float(input(Enter Radius:))
 pi = 22/7
 Area = pi*Radius**2
 print (Area of a Circle = ,(Area))</p> <p>3. Radius = float(input(Enter Radius:))
 pi = 22/7
 Area = pi*Radius ^ 2
 print ('Area of a Circle = ',(Area))</p> <p>5. Radius = float(input('Enter Radius: '))
 pi = 22/7
 Area = pi*Radius**2
 print ('Area of a Circle = ',(Area))</p> | <p>2. Radius = float(input('Enter Radius: '))
 pi = 22/7
 Area = pi*Radius ^ 2
 print ('Area of a Circle = ',(Area))</p> <p>4. Radius = float('Enter Radius: ')
 pi = 22/7
 Area = pi*Radius**2
 print ('Area of a Circle = ',(Area))</p> |
|--|---|

- Use following python code to answer the questions 35 and 36

```
i = 10
while i<= 15:
    print(i)
    if i == 10:
        print(" Now it is 10 ")
    i = i+1
```

- 35 What is the data type of the variable 'i' ?,
 1. List 2. int 3. tuple 4. Float 5. string
- 36 How many times the statement 'Now it is 10' will be displayed when executing this code?
 1. 15 2. 10 3. 1 4. 14 5. It is never displayed
- 37 The answer obtained when executing 20+3**2-10/2 python code will be,
 1. 40.0 2. 24.0 3. 20.0 4. 25.0 5. 30.0
- 38 Select the answer which contains values returned by executing following Python codes
 A. (0 == 1) and (3<4) B. (0 == 1) or (3<4) C. not((5<12) and (2*9<=10))
- | | | |
|--------------|-----------|-----------|
| 1. A = False | B = False | C = False |
| 2. A = False | B = True | C = True |
| 3. A = False | B = False | C = True |
| 4. A = True | B = True | C = False |
| 5. A = True | B = True | C = False |

39. What is the output of following python function block

```
def calculation(a):  
    if a == 1:  
        return 1  
    else:  
        return a * (a-1)  
print(calculation(6))
```

1. calculation(6) 2. 30 3. 6 4. 5 5. a

40. Select the output value of these statements

```
>>> a = ['abc', (1, 5.6, 'cde'), 100, 10.57, 6, 'abc', 6, 8]  
>>> a[1][2]
```

1. 'cde' 2. (1, 5.6, 'cde') 3. b 4. 100 5. 'abc', (1, 5.6, 'cde')

41. Consider following python code segment

```
a=open("doc1.txt","w")
```

What is the access type of this code?

1. Only for retrieving data
2. To open a new file
3. To insert data into an existing file and to record data in that file
4. To remove data in an existing file
5. To remove data in existing or new file and insert new data

• Use following python code to answer questions from 42 to 44

```
n=1  
a = input("Enter a :")  
a = int(a)  
while n<=12:  
    print(a," x ",n," = ",n*a)  
    n+=2
```

42. The code executes when the value of 'n' is,

1. Only when it is a 2. Only when it is 12 3. Less than 12
4. Less than 13 5. Less than a

43. What will be done by a = int(a) statement

1. Keep the value of 'a' is fixed
2. Convert the variable 'a' into a constant
3. Convert the data type of 'a' into integer
4. Outputs the value of 'a'
5. Converts the value of 'a' into an array

44. What is the alternate code suitable for n+=2

1. n=n+1 2. n=n*2 3. n=n+2 4. n=n-2 5. n=n+12

- 45 What will be the result of following python code

```
p=(12,34,24,19)
print(type(p))
```
1. 12,34,24,19
 2. <class 'tuple'>
 3. [12],[34],[24],[19]
 4. Syntax error
 5. <class 'list'>
- 46 What are the suitable values for <input> attribute used in HTML forms
1. radio, text, textarea
 2. radio, text, checkbox
 3. checkbox, textbox, textarea
 4. select, radio, textarea
 5. select, radio, textbox
- 47 Select suitable HTML code for creating hyperlink
1. DOE web
 2. <a> http://doeweb.com DOE web
 3. DOE web
 4. DOE web
 5. <a link > = "http://doeweb.com" DOE web
- 48 Which HTML tag from followings does not require an end tag?
1.
 2. <title>
 3.
 4.

 5.
- 49 Amila says that the homepage of a website should be named in a standard file name. What should be that standard name?
1. home.doc
 2. home.html
 3. index.com
 4. main.html
 5. index.html
- 50 Select the HTML code suitable for formatting texts X^2 , H_2O respectively as,
1. X_{2} , $H^{2}O$
 2. X^{2} , $H_{2}O$
 3. $\text{^{X2}}$, $\text{_{H2O}}$
 4. $\text{_{X2}}$, $\text{^{H2O}}$
 5. $\text{_{X2}}$, $\text{^{H2O}}$

Index No : Information and Communication Technology II Three Hours

Part –A - Structured essay

- 1). a). Describe Volatile memory and Non volatile memory in computers and give two examples for each memory type.

- ii. Random Access

c). Represent Fetch - Execute Cycle in a diagram.

2). a). Compare Batch Processing and Real Time Processing

b). What are Expert Systems ? Define.

c). Describe with suitable examples the functional requirements and non - functional requirements of systems

3). a). Mention two advantages acquired presently by using Unicode coding system.

b). Mention two guided media and two unguided media used in data transmission.

c). What are the components which constitutes a Uniform Resource Located (URL) ?

- 4). a). Mention briefly the effect of disk fragmentation.
- b). What are the methods of storage allocation?
- c). What is virtual memory? Define.
- d). Briefly describe the usage of device driver software.

Second Team Test – 2019
Information Communication Technology -13 – Part II
Part B

- 1). There is a security system used in a house and the system contains following components.
- A manual switch to operate the system manually.
 - A laser beam sensor to identify whether somebody has entered into the garden.
 - A motion detector to detect human walking.

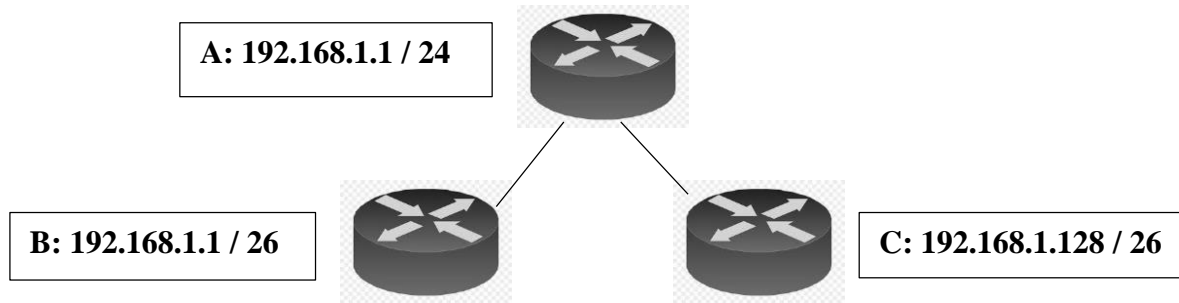
The laser beam system identifies whether there is somebody entered into the garden and another system identifies whether a human is walking. A strange person or animal may enter into the garden. Laser beam sensor activates when anybody enters into the garden by observing its walking style. If it is detected as a human entered into the garden a motion detector activates and the warning alarm (P1) starts ringing. If it doesn't identify as a human, only the laser beam sensor activates and a bulb(P2) lights up indicating that there is an animal entered into the garden.

The system can be deactivated by activating manual switch

inputs	Boolean values	Processes
S	1	Manual switch is activated
	0	Manual switch is deactivated
L	1	Laser beam sensor activated
	0	Laser beam sensor deactivated
M	1	Motion detector activated
	0	Motion detector deactivated

- a) Represent the instances of ringing the warning alarm (P1) and lighting up the bulb (P2) in a truth table
 - b) Write a SOP expression that represents both instances of ringing warning alarm and activating the bulb.
 - c) Simplify the Boolean expression obtained in (b)
 - d) Construct a logic circuit for obtained simplified expression in (c)
- 2). There are 30 students in an Advanced Level commerce class. You have to input the Name and ICT marks of students into two separate text files. If marks are greater than or equal to 50, students' names and marks should be inserted into 'PASS.txt' file and if marks are less than 50, students' names and marks should be inserted into 'FAIL.txt' file.
- a).
 - i. Draw a flowchart that represents a solution for this problem
 - ii. write a pseudocode for solving the problem.
 - b). Write a Python programme to solve this problem.

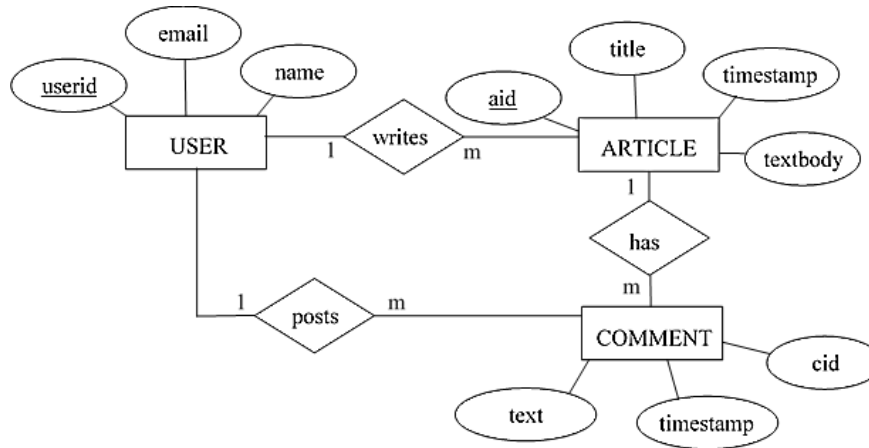
- 3). a). Following picture represents a part of a computer network. Show using appropriate calculations that, a data packet containing receiver's address (192.168.1.132) is distributed by router A to the network, router B rejects the data packet and router C accepts the data packet.



- b). In an ICT teaching center there are two computer labs called A and B containing 42 computers in each lab and another two computer labs called C and D containing 25 computers in each lab. The manager expects to construct these computer labs as separate subnets. A Wi-Fi network (E) for laptop computers and smart phones of students limiting to maximum 50 devices is going to be constructed as another subnet. The address of the main router is 192.168.10.1/24. All networks should have the access to internet via the main router.

- Prepare a list of networking devices required for constructing these subnets.
- Mention the subnet mask, network ID, broadcast address and the IP addresses of first and last hosts of each subnet.

- 4). Study following ER diagram and answer given questions.



- Write the relational schema obtainable from this ER diagram.
- Write SQL statements to create USER table and ARTICLE table.
- Write SQL statements to insert a new field as "address" into USER table.
- Write SQL statements to insert following record into USER table

1125	saman@gmail.com	Saman Perera	Kurunegala
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- Define what is normalization of data tables and mention the advantages of normalization.

- 5). A description about a company which provides vehicles for rent is given below. Represent the description in a Level-1 Data Flow Diagram.

Customers can make an inquiry about available vehicles by calling to customer services assistant. Customer services assistant works on inquiries about vehicles and orders. Customer services assistant refers the vehicle information book, obtains details about vehicles and provides details about available vehicles to customers. If the customer wishes to order a vehicle after considering given details about available vehicles, the customer provides order details to the customer services assistant. Customer services assistant accepts the order and keeps the order details in Orders file, gives order reference number to the customer and update the vehicle information book using that order details.

Cashier works on customers' payments. Customer gives the order reference number and money to the cashier. Cashier gets order details from orders file considering the given order reference number, processes the payment receipt, gives the payment receipt to the customer and updates the Orders file entering payment details of orders. Further, the cashier mentions payment details in the cash book. End of the working hours the cashier sends a summary of daily payment details to the manager by referring cash book.

- 6). Following is a part of a website available for online registration for courses in a University. Write HTML codes that display this part of the web page. The web page contains an image named "logo.jpg".

	University of Vocational Education
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Registration for Undergraduate Degree Programmes

Name with initials:

Postal address:

Email address:

Contact Number:

Degree Programme:

- Bachelor of Technology in Multimedia
- Bachelor of Technology in Networking
- Bachelor of Technology in Software
- Bachelor of Technology in Industrial Management
- Bachelor of Technology in Building Services
- Bachelor of Technology in Manufacturing
- Bachelor of Technology in Mechatronics
- Bachelor of Technology in Food Processing

Information Communication technology

Second term test - Grade 13

Answer Script

Paper i

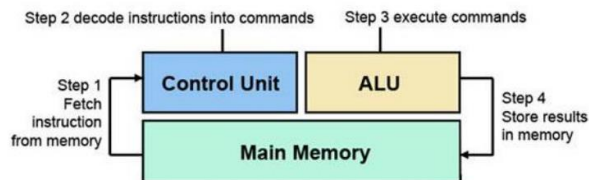
Q	Ans.	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	2	11	4	21	4	31	2	41	2
2	4	12	4	22	2	32	3	42	2
3	2	13	3	23	2	33	2	43	3
4	4	14	2	24	3	34	5	44	1
5	2	15	5	25	4	35	2	45	2
6	4	16	1	26	4	36	3	46	2
7	1	17	5	27	4	37	2	47	3
8	2	18	4	28	5	38	2	48	4
9	3	19	2	29	3	39	2	49	5
10	2	20	1	30	3	40	1	50	2

Paper ii

Part A

- 1) a. Volatile memory is computer storage that only maintains its data while the device is powered. Most RAM (random access memory) used for primary storage in personal computers is volatile memory. Non-volatile memory (NVM) is a type of computer memory that has the capability to hold saved data even if the power is turned off. Unlike volatile memory, NVM does not require its memory data to be periodically refreshed. It is commonly used for secondary storage or long-term consistent storage. 4 Marks
- b. In computer science, sequential access means that a group of elements (such as data in a memory array or a disk file or on magnetic tape data storage) is accessed in a predetermined, ordered sequence. Sequential access is sometimes the only way of accessing the data, for example if it is on a tape. In computer science, random access (more precisely and more generally called direct access) is the ability to access an arbitrary element of a sequence in equal time or any item of data from a population of addressable elements roughly as easily and efficiently as any other, no matter how many elements may be in the set 3 Marks

C.



3 Marks

- 2) a. Data input and processing occur as a batch in batch processing. It is easy to handle huge amount of data as a batch. So, data stored until the system comes online to process the data in one 'batch'. Batch processing is done in billing systems and pay roll system. In real time processing of data, input, processing and output as well as data storing occur simultaneously. Any type of monitoring system, any type of booking system, computer controlled systems such as automatic production line, an aircraft auto-pilot, the system controlling a nuclear power stations uses real time processing. 4 Marks

b. Expert Systems are computer applications that use artificial intelligence. To design an expert system, one needs a knowledge engineer, an individual who studies how human experts make decisions and translates the rules into terms that a computer can understand. 2 Marks

c. Functional requirements: What activities that the system should carry out. Describe the requested functionality/behavior of the system. Non Functional requirements: How well or with in what limits requirement should be satisfied 4 Marks

3) a. Creation of web sites in local languages
Development of software in Sinhala/ tamil
Applications of voice typing technologies

3 Marks

b. Guided media – Twisted Pair Cables, Coaxial Cables
Unguided media - Wifi, Blue tooth

4 Marks

c. **http://www.mnhs.com/webpages/about.html**
protocol domain name directory filename and extension

3 Marks

4) a. Files become fragmented when data is written to disk, and there is not enough contiguous space to hold the complete file. 2 Marks

b. - Contiguous Allocation - Linked Allocation - Indexed Allocation 3 Marks

c. Virtual memory is a memory management capability of an operating system (OS) that uses hardware and software to allow a computer to compensate for physical memory shortages by temporarily transferring data from random access memory (RAM) to disk storage. 2 Marks

d. In computing, a device driver is a computer program that operates or controls a particular type of device that is attached to a computer. A driver provides a software interface to hardware devices, enabling operating systems and other computer programs to access hardware functions without needing to know precise details about the hardware being used. 3 Marks

Part B

1. a.

S	L	M	P1	P2	Z
0	0	0	0	0	0
0	0	1	1	0	1
0	1	0	0	1	1
0	1	1	1	1	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	0	0	0
1	1	1	0	0	0

Z = The instances of ringing waring alarm and lighting up the bulb

5 Marks

b. SOP = $S'L'M + S'LM' + S'LM$

3 Marks

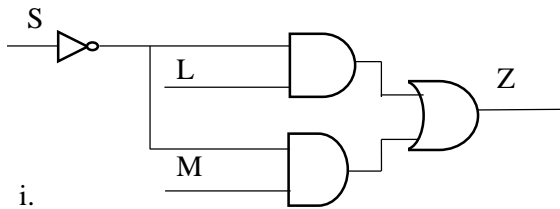
c.

SL	S'L	S'L'	SL	SL'
M		1		
M'				
M	1	1		

$$Z = S'L + S'M$$

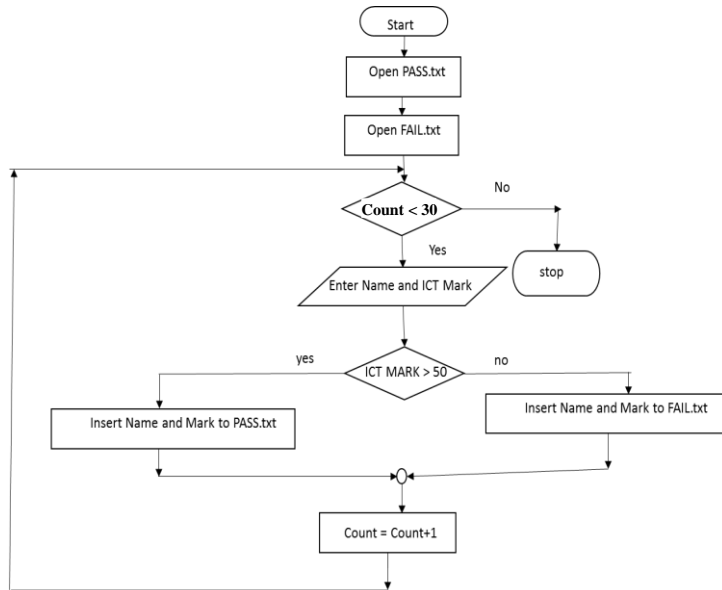
4 Marks

d.



3 Marks

2. a). i.



5 Marks

ii . BEGIN

```

OPEN PASS.txt
OPEN FAIL.txt
Count = 0
While count < 50
    Input Name and Marks
    If marks > 50 then
        Write to PASS.txt the Name and Marks
    Else
        Write to FAIL.txt the Name and Marks
    Count = count + 1
End while
End
  
```

5 Marks

b)

```

p=open("PASS.txt","a")
f=open("FAIL.txt","a")
count=0
while count<50:
    name=input("Enter Name : ")
    marks = int(input("Marks : "))
    if (marks>50):
        p.write(name)
    else:
        f.write(name)
    count=count+1
p.close()
f.close()
  
```

5 Marks

3. a.	Data Packet IP Address	192.168.1.132
		11000000.10101000.00000001.10000100
	Router A IP	192.168.1.1
		11000000.10101000.00000001.00000001
	Router A Subnet	11111111.11111111.11111111.00000000
	Router Net IP(Bit Wise And)	11000000.10101000.00000001.00000000
	Data Packet	11000000.10101000.00000001.10000100
	Router Sub Net MAsk	11111111.11111111.11111111.00000000
	Bitwise AND	11000000.10101000.00000001.00000000
	Bitwise AND is same for Router and Data Packet. So Router will Accept the packet	
	Router B IP	192.168.1.1
		11000000.10101000.00000001.00000001
	Router B Subnet	11111111.11111111.11111111.11000000
	Bitwise AND	11000000.10101000.00000001.00000000
	Data Packet	11000000.10101000.00000001.10000100
	Router B Subnet	11111111.11111111.11111111.11000000
	Bitwise AND	11000000.10101000.00000001.10000000
	Bitwise AND is not same for router B and Data Packet. So Router will reject the packet	
	Router C IP	192.168.1.128
		11000000.10101000.00000001.10000000
	Router C Subnet	11111111.11111111.11111111.11000000
	Bitwise AND	11000000.10101000.00000001.10000000
	Data Packet	11000000.10101000.00000001.10000100
	Router C Subnet	11111111.11111111.11111111.11000000
	Bitwise AND	11000000.10101000.00000001.10000000
	Bitwise AND is same for Router C Subnet and Packet. So router will accept the packet	

6 Marks

- b. i. Devices 4 Routers or Layer Switch / Bridge
 Network Switch 4 Wi-Fi Router
 RJ45 Connectors Twisted Pair Cables

4 Marks

ii.

Network	PC	~	Network IP	Subnet Mask	Broadcast IP	IP Range
Net A	42	64	192.168.10.0	255.255.255.192	192.168.10.63	192.168.10.1~62
Net B	42	64	192.168.10.64	255.255.255.192	192.168.10.127	192.168.10.65~126
Net C	25	32	192.168.10.128	255.255.255.224	192.168.10.159	192.168.10.129~158
Net D	25	32	192.168.10.160	255.255.255.224	192.168.10.191	192.168.10.161~190
Net E	~50	64	192.168.10.192	255.255.255.192	192.168.10.255	192.168.10.193~254

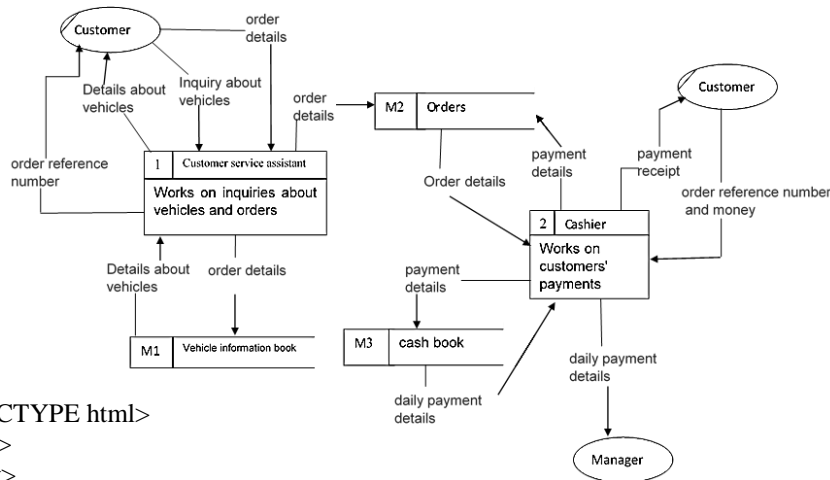
1 Mark x 5 = 05 marks

4. a. user(userid,email,name)
 article(aid,title,timestamp,textbody,userid)
 comment(cid,userid,aid,timestamp,text) 3 Marks
- b. create table user(userid int(6), email varchar(25), name varchar(25), primary key (userid));
 create table articles(aid int(6), title varchar(5), timestamp varchar(10), textbody varchar(20), userid int(6),
 primary key (aid), foreign key(userid) references user(userid)); 2 Marks x 2 = 4 marks
- c. alter table user add adress varchar(50); 2 Marks
- d. insert into user(userid, email, name, address) values(1125,'saman@gmail.com','Saman Perera','Kurunegala'); 3 Marks

- e. Normalization is the process of reorganizing data in a database so that it meets two basic requirements: (1) There is no redundancy of data (all data is stored in only one place), and (2) data dependencies are logical (all related data items are stored together). The benefits of normalization include: Searching, sorting, and creating indexes is faster, since tables are narrower, fewer null values and less redundant data, and making the database more compact.

3 Marks

5.



15 Marks

```

6. <!DOCTYPE html>
<html>
<body>
<Table border = "1">
<tr>
<td>
<img src = "logo.jpg" width = "100" height = "100">
</td>
<td>
<h1>University of Vocational Education</h1>
</td>
</tr>
</table>
<H2> Registration for Undergraduate Degree Programmes </H2>
<hr>
<form>
<b>Name with initials:</b> <input type="text" name="fname" size="50"><br> <br>
<b>Postal address:</b> <input type="text" name="address" size="50"><br> <br>
<b>Email address:</b> <input type="text" name="email" size="50"><br><br>
<b>Contact Number:</b> <input type="text" name="contact" size="50" ><br><br>
<b>Degree Programme:</b>
<select>
<option value="opt0"> </option>
<option value="opt1">Bachelor of Technology in Multimedia </option>
<option value="opt2"> Bachelor of Technology in Networking </option>
<option value="opt3">Bachelor of Technology in Software</option>
<option value="opt4">Bachelor of Technology in Industrial Management </option>
<option value="opt5">Bachelor of Technology in Building Services </option>
<option value="opt6">Bachelor of Technology in Manufacturing </option>
<option value="opt7">Bachelor of Technology in Mechatronics </option>
<option value="opt8">Bachelor of Technology in Food Processing</option>
</select> <Br> <br>
<input type="submit" value="Submit">
</form>
</body></html>

```

15 Marks