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Provincial Department of Education - NWP

20 E II

First Term Test - Grade 13 - 2020

Index No : .... Information and Communication Technology II Three Hours

Answer all questions in Part A and only four questions selected from part B

Part –A

- **Answer all the four questions on this paper itself.**
- **Write your answers in the space provided for each question.**

01. (a) Name the main steps of the Data Life Cycle.

....

(b) Complete the following diagram related to the abstract model of information creation.



(c) Services of the cloud computing are divided into 03 categories. Complete the following diagram according to that.

Cloud Computing

IaaS	………………….	………………….
Ex:- Google drive	Ex:- Google docs	Ex:- Google app engine
………………………	………………………	………………………

(d) Select the most suitable term from the bracket for each of the following definitions about data input methods.

(Remote Access, Direct Data Input, Online, Offline, Real time)

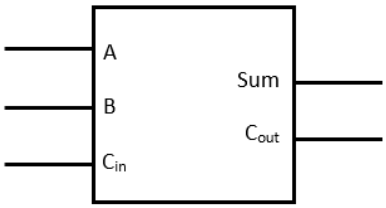
i. ....is inputting data without intervention of the users.

ii. Data input occurs at the time of transaction in ……………….method.

iii. Although in ……………………., data is input into the system directly without direct user interference, in ……………………. data storing and transactions are taking place in different geographical places.

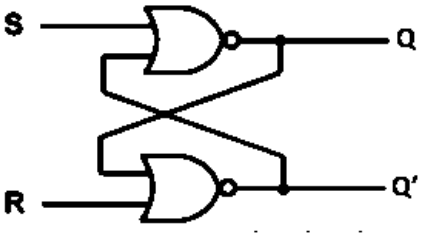
02. Following is a block diagram of a Full Adder. Draw a Full Adder in the given space using logic gates considering that diagram.

(a)



(b) Briefly explain the basic usage of a **Latch Flip-flop** and complete the truth table related to the given Latch Flip-flop.

……
……
……
……
……



S	R	Q	Q'
1	0		
0	0		
0	1		
0	0		
1	1		

03. Consider the following two tables **BOOK** and **AUTHOR**. Answer the questions only considering the data shown in the tables.

BOOK Table

BookID	**BookName**	**AuthorID**	**Price**	**PublishedYear**
B0011	Madol Duwa	A005	Rs. 350/=	1992
B0012	Akkara Paha	A002	Rs. 750/=	1983
B0013	Amba Yaluwo	A003	Rs. 600/=	1995
B0014	Ape Gama	A005	Rs. 625/=	2000
B0015	Bawa Tharanaya	A005	Rs. 350/=	2001

AUTHOR Table

AuthorID	**AuthorName**	**DateOfBirth**	**Address**	**Contact**
A001	K. Jayathilaka	1941.05.14	No 179/B, Heerassagala, Penideniya	0812245987
A002	Madawala S. Rathnayaka	1933.04.05	"Singha", Dikarawa , Bandarawela	0572245653
A003	T.B. Illangarathna	1952.12.11	No 84, Udugama,Akuressa	0912225687
A004	Karunasena Jayalath	1948.06.30	No 89/D, Seda Mawatha, Kelaniya	0112229478
A005	Martin Wickramasinghe	1961.08.13	Baddegama, Galle	0912236974

(a) Draw the entity relationship diagram to show the relationship between these two tables. (Cardinality should be clearly shown.)

(b) Write the SQL query required to input the following record to the above BOOK table.

'B0010','Upan daa sita','A005','Rs.550/=','2015'

.....

.....

.....

(c) It is required to get a list of books written by an author with the Author ID "A005". Write down the SQL query required for this.

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.....

(d) What are the features of a table in second normal form?

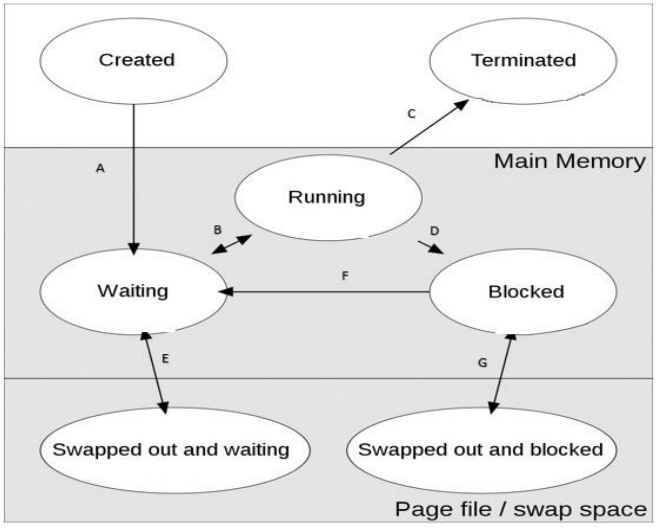
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04. Following is a Process State Transition diagram.



(a) Name A, B, C, D, E and F

A - ……. B - …….

C - ……. D - …….

E - …… F - …….

(b) Total number of frames of the physical memory of a certain computer is 2^{22}. The total capacity of that memory is 8GB. Calculate the size of a frame in the physical memory.

.....

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.....

First Term Test – 2020

Information Communication Technology -13 - Part B

Important:

*** Answer only four questions from part** B.

Part B

01. An application has been developed in order to quarantine people, who are suffering from various illnesses due to a disease caused by a virus, which is difficult to be controlled. There the application identifies whether a person or a few of them have cold with fever (S1) and sore throat or breathing difficulties (S2).If the system reveals a person has both symptoms he is sent to be quarantined (Q). If it is found that a person with no cold with fewer but has sore throat or breathing difficulties and has contacted a person within last 14 days who is already positive with the virus (C), will also be sent for quarantine(Q).

Situation	Logical Value
Identifying a person who has cold with fever by the system.	**1**
Identifying sore throat or breathing difficulties.	**1**
Not having contact with any virus infected patient within 14 days.	**1**
Sending a person for quarantine.	**1**

Answer the following questions about sending a person for quarantine considering the functions of the above application.

(a) Draw the truth table that shows sending a person for quarantine
(b) Get the SOP expression relevant to the output of the truth table.
(c) Get the POS expression relevant to the output of the truth table.
(d) Simplify the Boolean expression you got for above **b**.
(e) Design a logic circuit diagram related to the above simplified Boolean expression using only NOR gates.

02. A company named **COSMIC** decide to network its departments using the IP address 172.40.0.0/23 in order to make 04 subnets and assigning them to each department. Number of computers owned by each department are given below.

Department	Number of Computers
PRODUCTION	200
SUPPLY	120
HUMAN RESOURCE	50
SALES	25

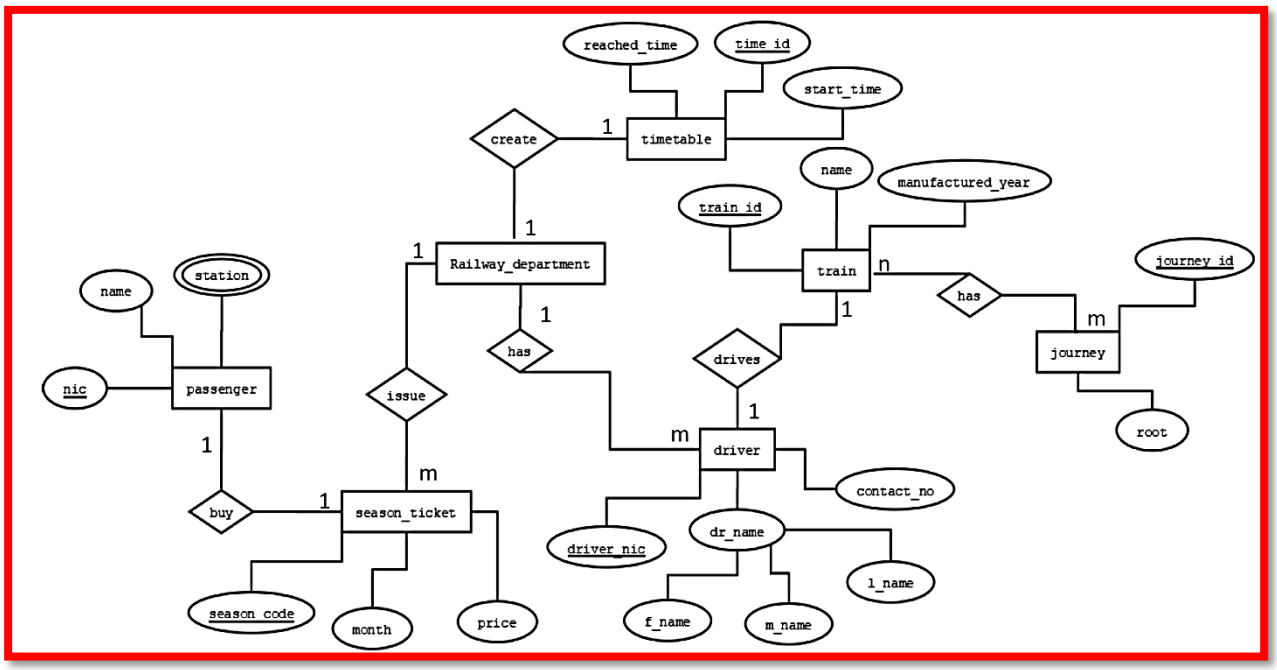
There is internet connection for the network of PRODUCTION department where there are a Proxy Server and a Web Server. There is an Employee Information System (EIS) installed in the HUMAN RESOURCE department and there is a Customer Information System (CIS) installed in the SUPPLY Department. A printer is set up in the Sales department.

(i) Complete the following table with the relevant information according to establishing the above network.

Department	Subnet Mask	Network Address	Broadcast Address	Host IP Range	Number Of Computers To Be Established In The Network.
PRODUCTION					
SUPPLY					
HUMAN RESOURCE					
SALES					

(ii) Design a logical network diagram with suitable network devices to develop the above network.

03. Note the following Entity Relationship Diagram (ER).



(a) The date of issue (issued_date) of the season ticket must be inserted in this database. Write the most suitable entity or the relation for that.

(b) Classify all the relationships included here according to their cardinality.

(c) Write down all the tables with their attributes generated by this Entity Relationship diagram.

(d) Write the primary keys for all the tables you named in (c) above.

(e) There are local railway stations for the Railway Department and the General Manager of Railways decides to issue season tickets at the first week of every month by each station. Draw how the ER diagram should be changed according to this decision. (It is sufficient to draw only the relevant part of the ER diagram.)

04. Following is a description of a processing system in an organization called **Virgo** which performs online sales and distribution.

The name, email address and the phone number must be entered into Virgo for a person to register in it. Then the system sends the registration request to the manager with the required information for the registration. The manager verifies the registration after checking that information. Then the applicant becomes a registered customer for this organization and he or she is given a Registration Number and a User name. After entering the Registration Number and the User Name into Virgo, the ordered item list with the prices can be viewed. After the required items are selected, the total price for them is calculated and given to the customer. The online payments are processed after the credit card information is entered into Virgo. The Payment Details and Item List are given to the cashier by the system and after checking the Payment Details the cashier hands over the Item List to the Sales Officer. The Sales Officer gives the relevant items and the Item Description to the customer and after taking the signature of the customer into the Delivery Note the Sales Officer finally hands over it to the Cashier. The Cashier enters the Delivery Verification Description into the System. At the end of the day the Daily Sales Summery is sent to the Manager by a SMS. When the organization requires selling new items, the manager updates the new items list.

(a) Write two functional requirements and two nonfunctional requirements of this system.

(b) Draw the context diagram (DFD level0) related to this description

05. The following incomplete function arranges the items of a given list in an ascending order.

(a) Fill in the blanks A and B.

```
def f1(a):
    for i in range(1,len(a)):
        for j in range(0,len(a)-i):
            if …….A……..
                a[j],a[j+1]=……..B……..
        print("step",i,a)
    print("final list  ",a)
x=[5,8,9,2,6]
f1(x)
```

(b) Find the output of the above code after it is executed.

(c) When a list is input it is required to find the maximum number of it.

(i) Draw a flowchart suitable for that.

(ii) Write the python code for the above flowchart naming as a function called f2.

06. (a) Following is a timetable prepared to give 10 Multiple Choice Questions(MCQs)for selected units online for grade 13 Information and Communication Technology students of a certain school in order to revise the subject.

Unit	**Quiz Open**		**Deadline**	
	Date	**Time**	**Date**	**Time**
1. Operating Systems	Feb 01, 2021	8.00 a.m.	Feb 08, 2021	11.00 p.m.
2. Networking	Feb 10, 2021	8.00 a.m.	Feb 17, 2021	11.00 p.m.
3. SSADM	Feb 20, 2021	8.00 a.m.	Feb 27, 2021	11.00 p.m.
4. HTML	March 01, 2021	8.00 a.m.	March 08, 2021	11.00 p.m.
• Maximum 03 attempts are allowed for each unit quiz set. Maximum marks for all your attempts are added for you.				

Write a suitable HTML code to render the above table.

(b) The following list shows the relevant competency levels with the respective units used to prepare the online Multiple Choice Questions mentioned in the above question (a).

1. Operating Systems
    - Competency Level 5.3 & 5.4
2. Networking
    - Competency Level 6.7,7.8 & 6.9
3. SSADM
    - Competency Level 7.1, 7.2 & 7.3
4. HTML
    - Competency Level 10.1 10.2 & 10.3

Write a suitable HTML code to render the above list.