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අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය 2022- උපකාරක ප්‍රශ්න පත්‍රය 05
General Certificate of Education (Adv. Level) Examination 2022- Model Paper 05

තොරතුරු හා සන්නිවේදන තාක්ෂණය - II
Information & Communication Technology - II

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II

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Three Hours

Section A – Structured Essays
Answer all the four questions in this paper

(01). (a). (i).

The following style sheets are expected to be used in a web page.

(Selector)	Style description
paragraph	Text color red, font size 14px
header 1	The text color is orange, centered
An id named "redPara".	Font size 10 px, centered, text color blue

To meet this requirement, write an appropriate internal style sheet (CSS) for the style definition in the table above.

.....

.....

.....

.....

.....

.....

(ii) Write an advantage of using CSS in an internal style sheet.

.....

.....

(iii) What happens when the following CSS code is executed?

<body style="background-image:url("flower.jpg")">

.....

.....

(b). What happens when the following CSS code is executed?

CID	CName	Lecturer
001	Java	Mrs.Silva
002	Python	

<table border="1">

.....

.....

.....

.....

(ii). What is the result of the html code Go to the section1 when using hyperlinks?

.....

.....

(iii). What is the output of the following html code ?

```
<ol>
    <li>Pull mask from overhead bin</li>
    <li>Place mask over face</li>
    <li>Pull strings tight</li>
</ol>
```

.....

.....

.....

.....

(02). (a). (i). The World Wide Web (WWW) is a service on the Internet. Write two other services on the Internet.

.....

.....

.....

(ii). Write the three main steps in the fetch execute life cycle.

.....

.....

.....

iii) Briefly Describe “Infrastructure as a Service”-IAAS, in cloud computing?

.....

.....

.....

(b). Fill in the blanks using suitable words from the words in brackets.

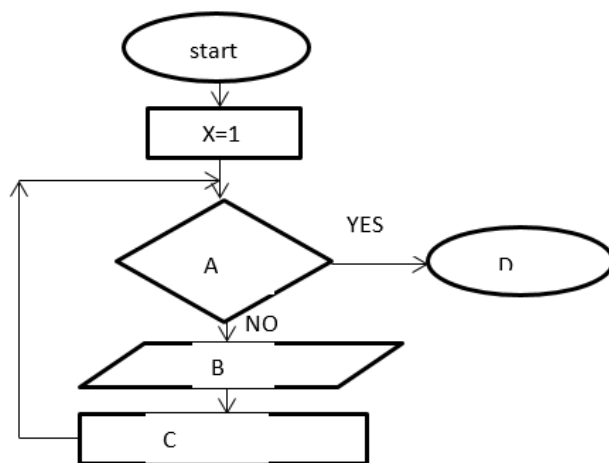
(Network, IP, UDP, PSTN, TCP, Data link, MAC, Gateway, PCM)

- (i) Converting an analog signal received over a telephone line into a digital signal is called
- (ii) International telephone system used for analogue voice communication using copper wires
It is known as
- iii) The unique address assigned to the networking interfaces is known as..... addresses.
- iv) in the transmission of the data to the receiver, that data are compressed
into frames at the layer.
- v)..... helps in forwarding data packets to the destination host.
- vi) The..... protocol verifies that data has been received from the source computer to the destination computer.

(c) Find out which type of numbered business type the following cases belong to and fill in the blanks in the table accordingly. (B2B, B2C, C2B, G2E, G2C, B2E.G2B)

	Event	Business Type
(i)	Microprocessors and motherboards manufactured by Intel company are ordered online by Dell company, and uses them to build and sell notebook computers.	
(ii)	A company intending to start a garment factory in wathupitiwala area to obtain details of the tax concessions provided by the government for the same through the internet.	
(iii)	Sandeep has started his business of manufacturing LED bulbs. Sandeep sells them online.	
(iv)	The owner of a telephone business sold his used smart phone through the websitedue to an urgent need for cash.	

- a) Suppose you want to draw a flowchart to show the numbers from one to ten (1,2,3,4,5,6,7,8,9,10).
Complete the following flowcharts for this.



b) Write the output of the following python codes

(i) `L=[40,70,20,30,2,1,5]`
`L.pop(2)`

.....

(ii) `A=[3,7,2,8,5,6,1,10,4]`
`print(A[6::-2])`

.....

(iii) `X=[3,7,6,5,10]`
`Y=[2,5,7,4,6,8,10,9]`
`Z=[]`
`for a in X:`
 `for b in Y:`
 `if a==b:`
 `if b%2==0:`
 `continue`
 `Z.append(b)`
`print(Z)`

(ලකුණු 0.5x6)

Select functional requirements and non-functional requirements from the following statements.

(0.5x6 marks)

- a) The system should be easily modifiable.
b) The user should be able to update his name.
c) Any phone number should be searchable in less than two seconds.
d) User friendly interface should be provided.to user.

e) The PCR kit should be able to detect the corona virus.

f) When dispensing fuel to a vehicle, the quantity of fuel currently dispensed can be known by the QR code.

(04) A 32KB program runs on a computer with 32KB memory. Below are some of the selected fields in the page table at a certain point in this program. Page numbers and frame numbers are given in binary.

Page number	Frame number Y	Yes/No bit
000	110	1
001	000	0
010	101	1
011	000	0
100	000	0
101	111	1
110	000	0
111	001	1

(i) If the size of a page in virtual memory is 4KB and a virtual reference refers to bytes, how many bits does a virtual reference displacement

.....

(ii) How many pages are there?

.....
.....
.....

(iii) Page 110 shows the frame number as 000 and the yes/no bit as 0 at this point. Write 02 reasons why the yes/no bit is recorded as 0 in the page table.

.....
.....

(iv) What is the physical memory reference of the virtual reference 000 0101 1000 1001?

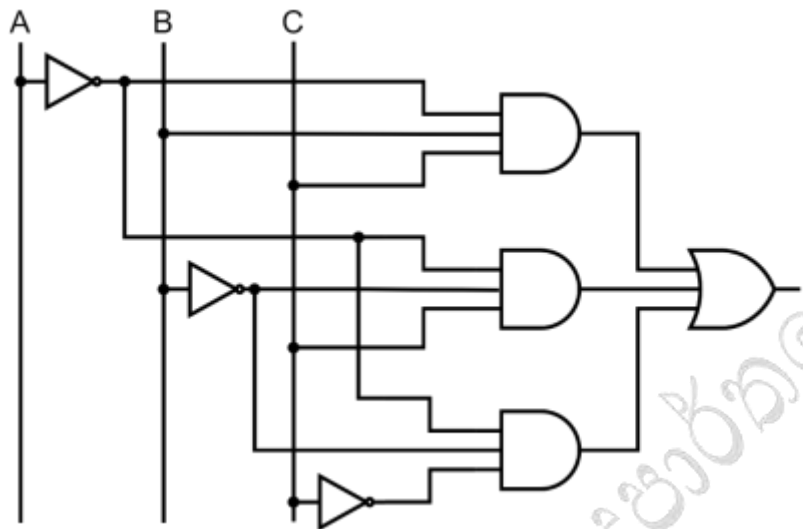
.....
.....
.....
.....

Section B – Essays

This section consists of six (06) questions. Answer only four (04) of these questions.

(1)

Consider the following circuit and answer the given questions



(a) Find the output for the above circuit

(b) Construct the complete truth table for the output of (a) above

		AB			
		01	00
C	0				
				

(c) Copy the following incomplete Kano map onto your answer sheet and derive the simple expression for the output obtained in (a) above

		AB			
		01	00
C	0				
				

(d) Design a circuit for the statement obtained in (c) above using only NOR gates

(e) Derive a simplified POS statement using the Kano map completed in (c) above

(2) .

(2) InforTec is a trading business importing computers and accessories. There are 05 divisions in this business namely Institutions, Accounts, Purchases, Distributions and Warehouses. Infor Tec intends to network using the IP address range 195.180.10.0/24 so that the 05 divisions can communicate with each other in order to carry out the functions of the business efficiently.

(a) When all the sections are sub netted, fill in the IP address ranges of each section in the answer sheet as per the table below.

Division	(Network ID)	(Broadcast IP)	(Subnet Mask)	(IP Range)
Institutions				
accounts				
Purchases				
distributions				
Stores				

(b) Give your suggestions as a student of information and communication technology to provide internet at optimum level for the entire network and protect it from external threats.

(c) Infor Tec is expected to provide the equipment required to build the entire network. If you are the network manager of Infor Tec, draw the logic diagram of the network you are proposing. (Note that Multilayer Switch is provided.

(3) ABC Book Company, a leading book trading company in Sri Lanka, conducts its business in an offline manner. It has a network branches which are established in major cities. The management of ABC Books Company has decided to trade online using the company's web portal WWW.ABC.LK.

(a) What type of business income model is used for this?

(b) Which e-commerce business model applies to the above business?

(c) Write 3 ways you can pay for an A-level ICT book online using WWW.ABC.LK.

(d) Mention one threat that can be faced by buying books online.

(e) Clearly write down 3 methods you suggest to carry out the above e-marketing process successfully.

(f) You need to purchase a mobile phone in your possession through an e-commerce website. Write 2 methods used for that.

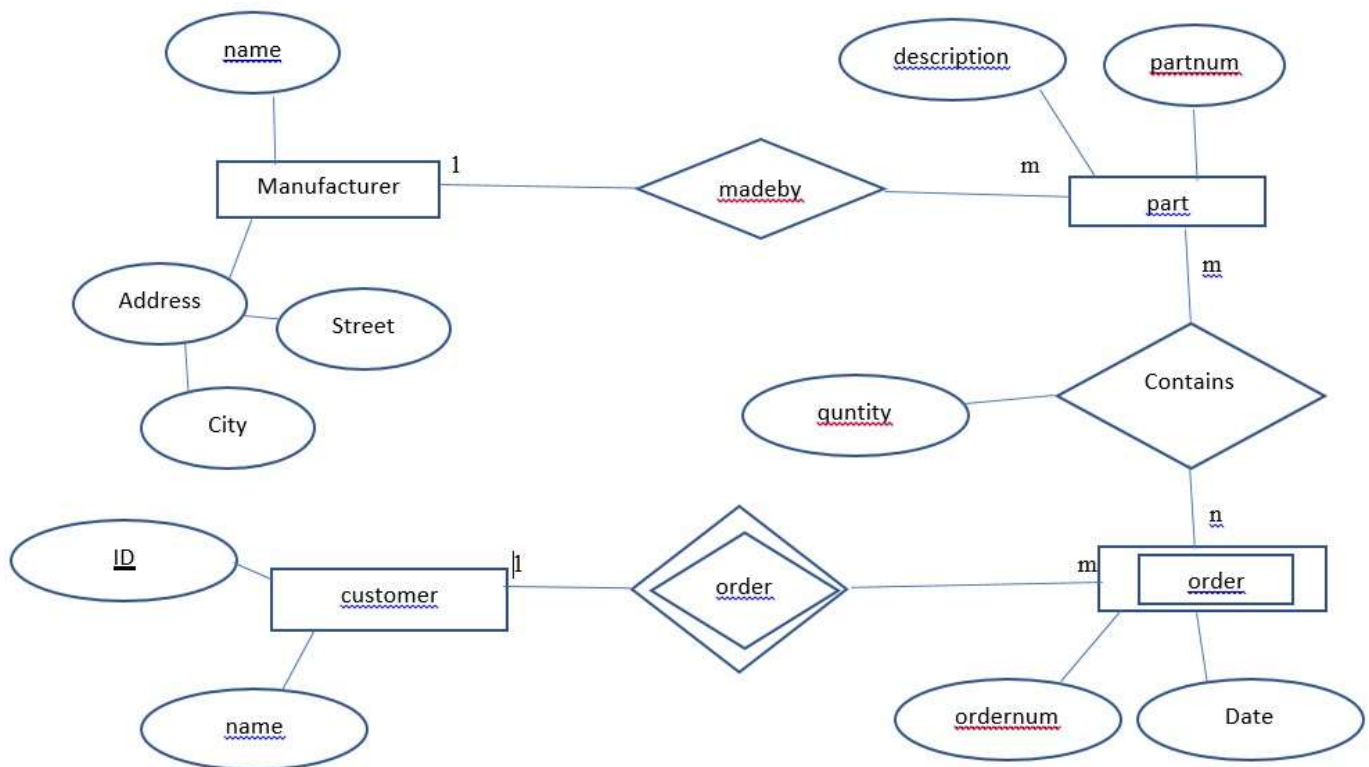
(g) What type of e-business transaction is used here?

(4) Input a sequence of numbers into list so that only even numbers are inserted into a new list.

- Create a flowchart to display the new list of even numbers.
- Verify the accuracy of your flowchart using a sample data list.
- Write the Python program related to the flowchart

5) a)

Write the relation schema (relation schema) related to the ER diagram below. Indicate the relevant relationships correctly.



- Construct a SQL statement to create part table ,which contains attributes relevant to the table.
- Write down the SQL statement for joining tables using INNER JOIN command to display PartNo, Partdescription,ManufactureName which Name is not similar to “Intel” in the Manufacture name field.

EmpID	Last_name	Department	Dependent _DOB	Dependent _Gender	Dependent_id
100	Perera	CS	2000/4/4	M	2000536020
		CS	2004/3/5	M	2003035562
			2005/3/2	F	2003056895
200	Silva	Acc	2008/5/3	M	5003205003
200	Silva	Acc	2002/5/2	M	2005656500
103	Disanayaka	HR	2005/3/7	M	2000563235

d) Consider the above table containing the information about Employee primary key - (EMPid) is used to identify each Dependent.

- What is the Normalization form that the above table is?
- According to the above table what is the next normal form.

(6) The following description is about an information system used by school students in a transport agency. The system is accessed by the bus owner, bus driver, and parents through a mobile phone app.

• **New member registration.**

The bus owner enters information about the bus, drivers, and new students into the system. Bus information, driver information and student information are stored in separate databases. When a new student or a new driver enters the system, the information is entered into the system through the bus owners.

• **Data retrieval.**

Bus drivers upload live location to the system every morning. The student or parent can get the live location of the bus through the mobile application. If the student does not come to school, he should give a message to the bus driver. He should update the student as “absent”. Bus drivers must update the system with the location and time of student boarding and alighting each morning and evening as students board and alight the bus. Parents can also know the time and location of the student boarding the bus. Daily arrival and departure information is temporarily stored in daly_det file. Bus operators also need to get information about the arrival and departure of students. Attendance information is stored in attendance_db.

Payment process.

At the end of every month, the bus owner receives the attendance of the students and calculates the monthly payment to be made by each student. He updates the payment information in the system and the system sends the payment information to the students through a message. The student can pay directly to the driver or pay online. If the student made the payment by road, the receipt should be sent to the driver through a WhatsApp message. Then the driver will update the system as “done”. The system will automatically send a reminder message to students who have not paid after a week.

(a) Using standard symbols

(i) Draw a context diagram.

(ii) Draw a data flow diagram level 1.

(b) State two functional and non-functional requirements as described above.

(c) The System Software Group has decided to make the above software a Commercial Off-the-shelf (COTS) package. For this, name two features that need to be improved here.

(d) Explain the need for a maintenance phase in a system with two points.