දිවයිනේ ජ්‍යෙෂ්ඨතම ICT ගුරුවරයාගේ 17 වන
වාර්ෂික මහා සම්මන්ත්‍රණය,

ICT 2025 A/L Final SEMINAR

- ✓ ඒඳින මුළු විෂය නිර්දේශයම ආවරණය වන පරීදි අනුමාන ප්‍රශ්න පත්‍රයක් ලබා දේ..
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B.Sc (IT), SCS, RHCSA, CCNA

15th OCTOBER

8.00AM to 3.00PM

@ Sasip Nugegoda

Fee - Rs. 1500/=

More info :
071 77 88 014

G.C.E. (Adv. Level) Examination - 2024

Information & Communication Technology - I

Answers

01.	①	②	~~③~~	④	⑤	26.	~~①~~	②	③	④	⑤
02.	①	②	③	~~④~~	⑤	27.	~~①~~	②	③	④	⑤
03.	①	②	③	~~④~~	⑤	28.	①	②	~~③~~	④	⑤
04.	①	~~②~~	③	④	⑤	29.	~~①~~	②	③	④	⑤
05.	①	②	~~③~~	④	⑤	30.	①	~~②~~	③	④	⑤
06.	①	②	③	④	~~⑤~~	31.	①	②	③	④	~~⑤~~
07.	①	②	③	~~④~~	⑤	32.	①	②	③	④	~~⑤~~
08.	①	②	~~③~~	④	⑤	33.	①	~~②~~	③	④	⑤
09.	①	~~②~~	③	④	⑤	34.	①	②	③	~~④~~	⑤
10.	①	②	~~③~~	④	⑤	35.	~~①~~	②	③	④	⑤
11.	~~①~~	②	③	④	⑤	36.	①	②	③	~~④~~	⑤
12.	①	②	③	④	~~⑤~~	37.	~~①~~	②	③	④	⑤
13.	①	②	③	~~④~~	⑤	38.	①	②	③	~~④~~	⑤
14.	①	②	③	④	~~⑤~~	39.	①	②	~~③~~	④	⑤
15.	①	②	~~③~~	④	⑤	40.	~~①~~	~~②~~	~~③~~	~~④~~	~~⑤~~
16.	~~①~~	②	③	④	⑤	41.	①	②	~~③~~	④	⑤
17.	~~①~~	②	③	④	⑤	42.	~~①~~	②	③	④	⑤
18.	①	②	③	④	~~⑤~~	43.	①	~~②~~	③	④	⑤
19.	①	~~②~~	③	④	⑤	44.	~~①~~	②	③	④	⑤
20.	①	②	~~③~~	④	⑤	45.	~~①~~	②	③	④	⑤
21.	①	②	③	~~④~~	⑤	46.	①	②	③	④	~~⑤~~
22.	①	~~②~~	③	④	⑤	47.	①	~~②~~	③	④	⑤
23.	①	②	③	~~④~~	~~⑤~~	48.	①	②	~~③~~	④	⑤
24.	~~①~~	②	③	④	⑤	49.	①	②	~~③~~	④	⑤
25.	①	②	③	④	~~⑤~~	50.	~~①~~	②	③	④	⑤

(01 - 50 - 50 marks)

G.C.E. (Adv. Level) Examination - 2024
Information & Communication Technology - II

Answers

Part A - Structured Essay

(a) (i)
- action
- select
- radio
- submit
- /select
- radio
- submit

(4 marks)

(ii) Write one of the following
- run/execute php file/script/code
- collected data is submitted to action_page.php for processing
- The form data is validated and sent to the specified page (action_page.php) for processing
- the action_page.php file/script/code is executed

(1 mark)

(iii) Write one of the following
- It will check whether the email address is in proper form.
- It will validate the email address

(1 mark)

(iv) Write one of the following
- It will check whether the input contains only 0 to 9.
- It will check whether the input contains only 10 digits

(1 mark)

(v) Write one of the following
- To display additional information when the cursor is moved over the hyperlink.
- To display '10, Hill street, Kandy' when the cursor is moved over the hyperlink.

(1 mark)

Note :- (Due to the error in the code line reference in the exam paper the marks allocated for this question was given those who attempted this part)

(b) It prints the student_id, first_name and last_name of the records from the 'students' ('stu_dents') table of the 'studentDB' database. (2 marks)

Marks allocated as follows :
- Records of the 'students' ('stu_dents') table of the 'studentDB' database (1 mark)
- Printing student_id, first_name and last_name (1 mark)

Note

Important :- The underscore (_) essential for field names. **(Total Marks - 10)**

(a) (i) A :- input/ data B :- process/ processing C :- output/ information

(1 mark)

(ii) Activity 1

Input :- user login details, login credentials, username + password

Process :- checking whether input valid/ user validation (authentication)

Output :- letting user in/ display home page (welcome message)

(1 mark)

Activity 2

Input :- item (s) to purchase/ selecting the items to purchase

Process :- compute total cost for the (selected items/ items in the shopping cart/ trolley)

Output :- total cost/ display total cost/ updated shopping (trolley/ cart)

(1 mark)

Activity 3

Input :- (debit) card information

Process :- do the payment process to do the fund transfer for the amount that has to be paid/ debit card validation/ bank processing/ accessing the payment gateway

Output :- confirmation of payment/ initiate the stationery delivery process/ showing the details relating to the payment

(1 mark)

(iii) Activity 2

Input :- last order reference/ last order details/ selecting 'Repeat previous order' option

Process :- get items of previous order and compute total cost for the selected items/ check the availability of previous order items and compute new total cost for the selected items.

Output :- display item details with total cost.

(1 mark)

(*b*) Vender must provide the setting up and configuration support. (1 mark)

(*c*) Write one of the following

- With ICT it is easier to get/ modify information and publish other's material as one's own.
- Using plagiarism removel tools/ paraphrasing tools can be used to publish other's contents as one's own.

(1 mark)

(*d*) The ICT sector has a high energy demand. Production of electronic devices and their use requires energy. Most energy production in the world still results in CO_2 emissions, adding to global warming. Thus there is a significant contribution of ICT to global warming.

(1 mark)

(e) Write one of the following

- Privacy violation/ breach
- Collected data could be used for targeted advertising/ given to third parties.

(1 mark)

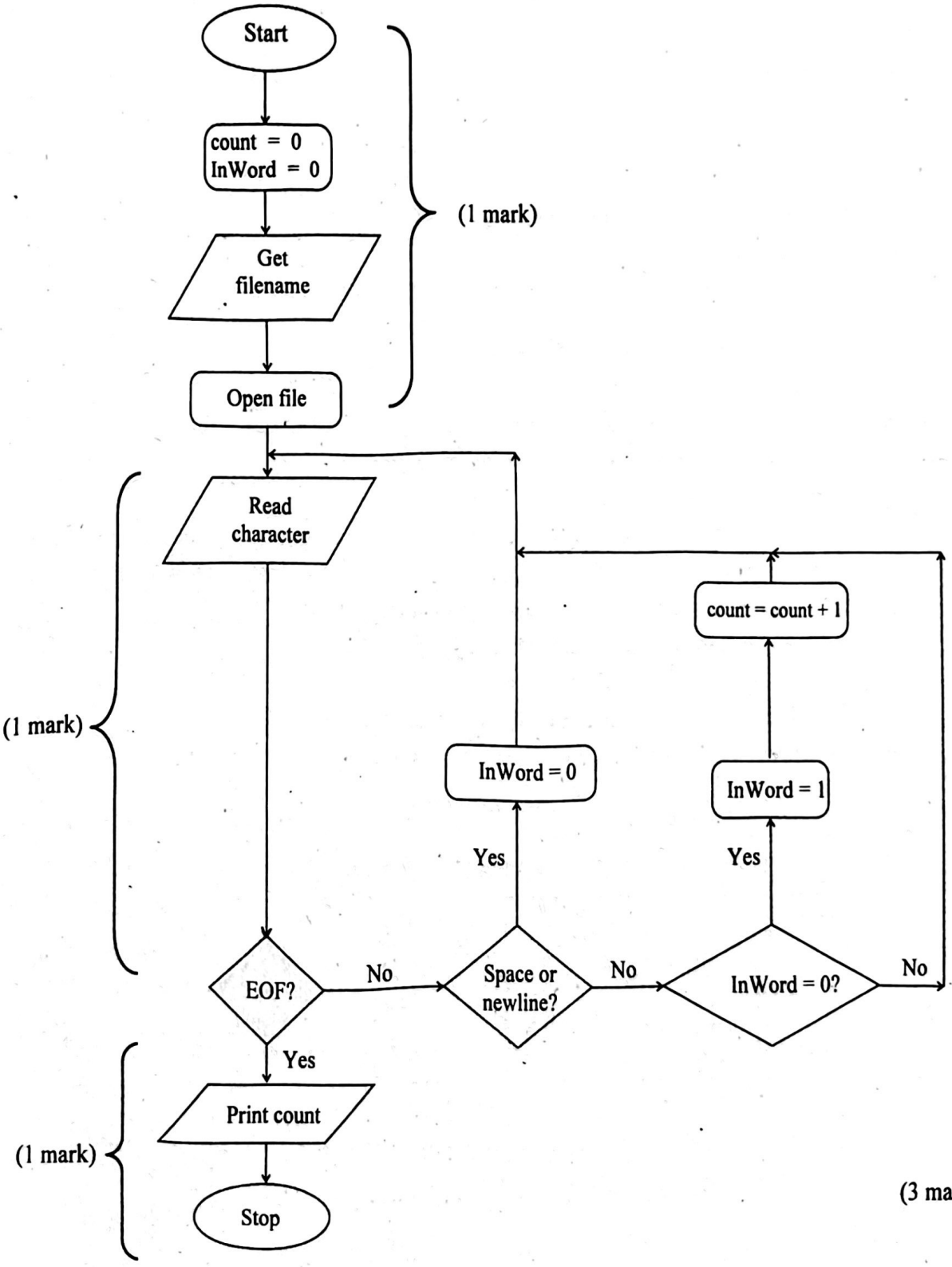
(f) sellers

lowest

(1 mark)

(Total Marks - 10)

(a)



(3 marks)

Note :-
- Other synonyms could be accepted for 'InWord' values
  e.g. for 0 : false. No
  for 1 : true. Yes
- If 'Inequality' checks are being used, then the 'yes', 'no' labels need to interchange.
- For the conditions, the question mark symbol (?) is essential.
- Synonyms for 'Get', 'Print' acceptable.

(*b*) [6, 12] (2 marks)

(*c*)
- int
- upper + 1
- num
- num%1
- break

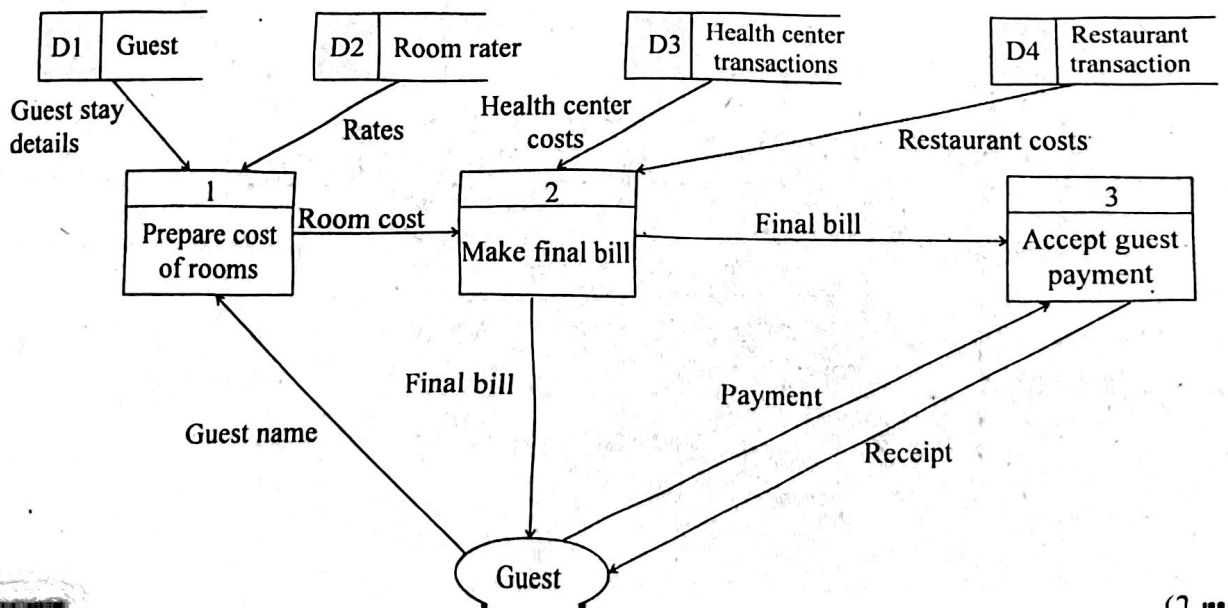
(5 marks)
(Total Marks - 10)

4. (*a*) (1) Feasibility study
(2) System analysis/ requirements analysis
(3) System design (1 mark)

(*b*) Write one of the following
- Provides early visualization for clients
- Reduces risks of project failure.
- Helps getting feedback and approval from clients
- Helps in early discovery of design problems/ errors
- Helps in cost/ resource estimation
- Helps in properly designing the system/ Helps in finding missing functionality/ Helps in refining requirements/ Helps the developers understand the user requirements better
- Makes users actively involved in the development process.
- Bridges the communication gap between developers and users
- Ensures greater level of client satisfaction
- Could be reused by the developer for other similar projects.
- Helps developers and users both understand the system better.

(1 mark)

(*c*) (i)



(2 marks)

Marks allocated as follows :

- Complete diagram part for '1. Prepare cost of rooms' with two data stores (1 mark)
- Complete diagram part for '2. Make final bill' with two data stores. (1 mark)
- Complete diagram part for '3. Accept guest payment' (1 mark)

(ii) **2. Make final bill**

Total cost = room cost of guest

DO WHILE there are restaurant transactions by guests
    Total cost = Total cost + restaurant cost
END WHILE

DO WHILE there are health center transactions by guests
    Total cost = Total cost + health center cost
END WHILE

Total cost = Total cost + (Total cost ✱0.1)

Note :-

(Total cost = Total cost ✱1.1 is also correct.)

(2 marks)

Marks allocated as follows :

- Considering room cost (0.5 marks)
- Considering restaurant cost (0.5 marks)
- Considering health center cost (0.5 marks)
- Service charge addition (0.5 marks)

(d) use (1 mark)

(e) small/ low (1 mark)

(f) A method that the manager can use :

- Assign weights to each feature (F1 and F2) based on their importance. Also assign weights to the acquiring and usage costs.
- For each option (A, B and C) evaluate how well it meets each feature and assign marks. Assign marks to the costs of the systems too (lower the costs, the higher the assigned mark)
- Multiply the marks by the weights for each criterion and sum them up to get the total score for each option.
- The option with the highest total weighted score is the most suitable choice.

(1 mark)

(Total Marks - 10)

✦✦✦✦

Part B

5. (a)

A	B	C	Z
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

(**Note** :- Z column can be labled as $\overline{\overline{A}B + C}$ too.) (2 marks)

(b) $(A + B) \cdot (A + \overline{B}) + A\overline{B}$

$(A + B) \cdot A + (A + B)\,\overline{B} + A\overline{B}$

$A \cdot A + BA + A\overline{B} + B \cdot \overline{B} + A\overline{B}$

$A + BA + A\overline{B} + A\overline{B}$

$A + BA + A\overline{B}$

$A + A\,(B + \overline{B})$

$A + A$

A

(**Note** :- Here final answer is enough for get full marks. Derivation is not required.)

(1 mark)

(c) (i)

A	B	C	Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

(2 marks)

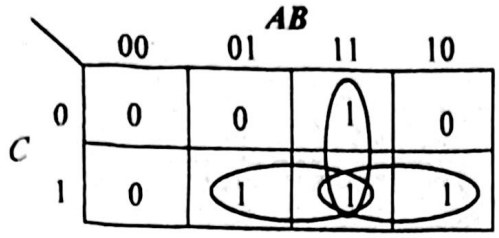
(ii)

C \ AB	00	01	11	10
0	0	0	1	0
1	0	1	1	1

(**Note** :- Indicating all 1's and 0's are compulsory)

(2 marks)

(iii)

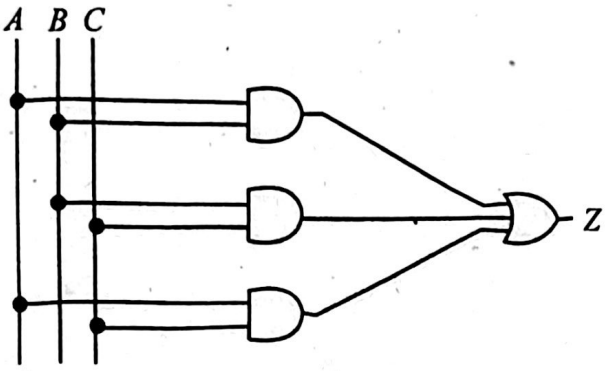


$Z = AB + BC + AC$ (2 marks)

Marks allocated as follows :

- Marking all three loops on the correct Karnaugh map (1 mark)
- Final expression (1 mark)

(iv)



(1 mark)

Marks allocated as follows :

* First set of AND gates (0.5 marks)
* Final OR gate (0.5 marks)

Note :- - Wire connections must be clearly indicated on a correct circuit.

- You can either indicate the wire connetions using the dark dots or use half-circles to indicate non-connecting wires.

d) (i) Write one of the following

- To add two bits together
- To add two single - bit binary numbers to produce a 'sum' and a 'carry' output
- To add the two least significant digits in a binary sum
- Used as a fundamental building block in digital circuits used in ALU chips.

(1 mark)

(ii) **Description -**

A flip - flop can store a bit of information and maintain it over time. Once a bit is stored. It retains its value until it is changed. Thus it works as a memory element in digital circuits.

How a flip - flop differs from combinational logic gates :-

Flip - flops	Combinational logic gates
Sequential circuit	Combinational circuit
Output depends on time and past states	Output depends only on inputs
Stores data	No memory
Works as a memory element	Outputs are based solely on current inputs.
Synchronized with clock pulses	No clock, outputs change instantly with inputs
Used to store and transfer data/ used in memory elements.	Performs logic operatons.

(2 marks)

Only one of the comparisons obove is enough as the answer.

Marks allocated as follows :

* Description (1 mark)
* Comparision (1 mark)

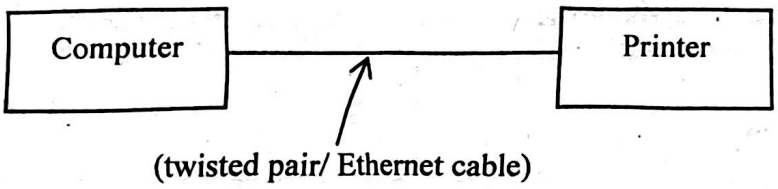
(iii)

INPUT			OUTPUT	
A	B	C - IN	C - OUT	S
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

(2 marks)

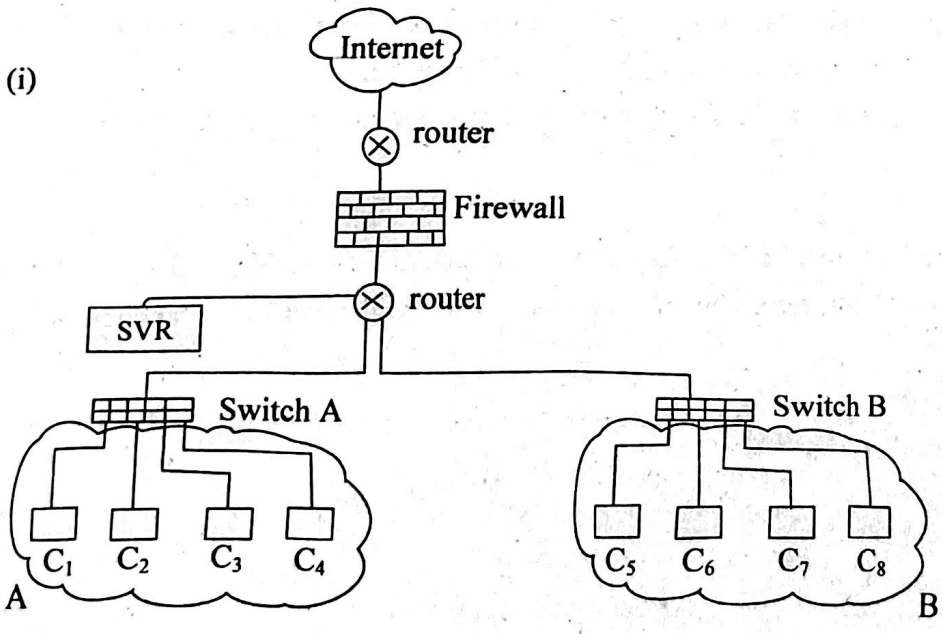
(Total Marks - 15)

6. (*a*)



(2 marks)

(*b*) (i)



(2 marks)

(ii) Write one of the following

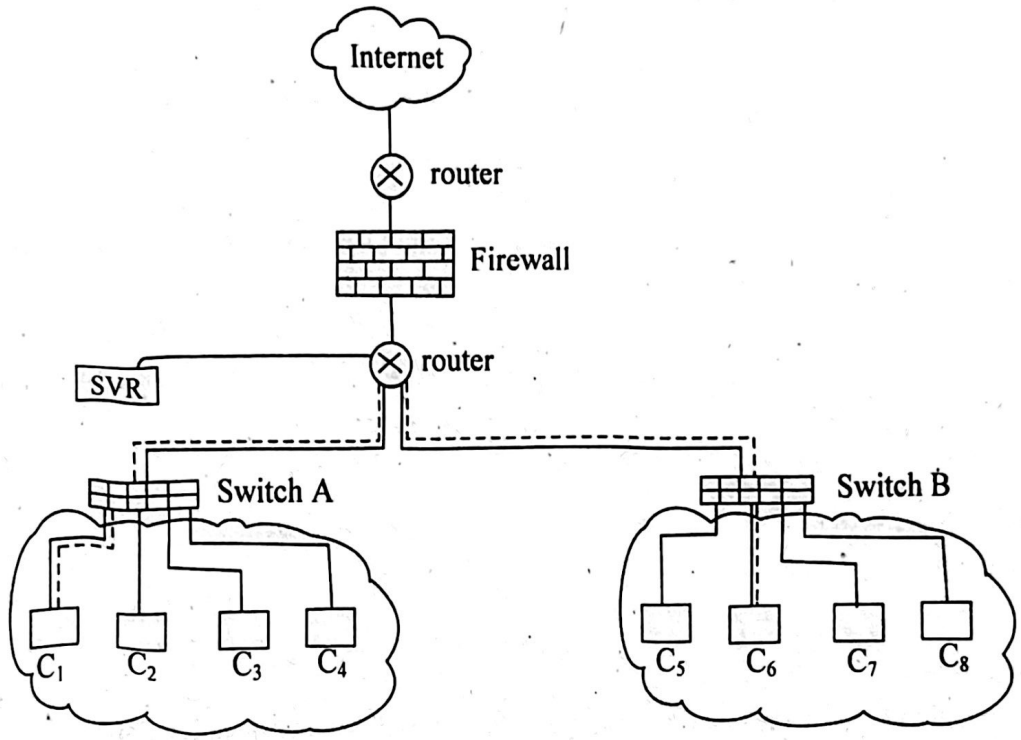
- Switches : To provide each LAN's connectivity to the Router.
- Switches : To give a connection to each computer of each LAN
- Router : To provide the connection to the internet
- Router : To provide the connectivity between the LAN's
- Firewall : To filter out the unwanted traffic.

(1 mark)

Notes :-

- To get this mark, the relevant device must be correctly placed on the Sstudent's diagram for 6. (b) (i)
- The SVR can be placed in one of the LAN's as well.

(iii)



(1 mark)

(c) (i) 255.255.255.0 (1 mark)

(ii)

Subnet	Network address	First usable IP address	Last usable IP address	Broadcast address
S1	192.168.100.0	192.168.100.1	192.168.100.30	192.168.100.31
S2	192.168.100.32	192.168.100.33	192.168.100.62	192.168.100.63
S3	192.168.100.64	192.168.100.65	192.168.100.94	192.168.100.95
S4	192.168.100.96	192.168.100.97	192.168.100.126	192.168.100.127
S5	192.168.100.128	192.168.100.129	192.168.100.158	192.168.100.159
S6	192.168.100.160	192.168.100.161	192.168.100.190	192.168.100.191

Marks allocated as follows :

* 0.5 marks for each correct row.

(0.5 × 6 = 3 marks)

Following two other alternatives are also accepted.

	192.168.100.192	192.168.100.193	192.168.100.222	192.168.100.223
	192.168.100.224	192.168.100.225	192.168.100.254	192.168.100.255

(*d*) (i) Write one of the following

- Provide a (look-up/ mapping) service to provide the corresponding IP address (es) relevant to the given URL
- Providing the IP address for the given URL
- Resolve a URL to its IP address. (1 mark)

(ii) **Hierarchical :-**
The DNS hierarchy consists of multiple levels of servers to direct Internet traffic efficiently.
(1.5 marks)

Distributed :-
There are many servers having the portions of the DNS records in a distributed manner in multiple locations in the internet.
(0.5 marks)

(*e*) (i) Application layer (0.5 marks)
(ii) Network access layer (0.5 marks)
(iii) Internet layer (0.5 marks)
(iv) Internet layer (0.5 marks)

(*f*) **Important :-**
In this question CFF has been erroneously printed as CEE in your question paper.
Therefore No marks are to be given for this part. Allocated marks for this part is added to 6 (*a*) and 6 (*b*) (i)
If the question was correctly printed as CFF, answers are as follows.
(i) +2 Shift
(ii) CAB

(Total Marks - 15)

7. (*a*) (i) Sensor used in this circuit is a magnetically controlled, electromechnical switch (Reed Switch). It is sensitive to a magnetic field and acts as a switch accordingly. When the door is closed (applied with a magnetic field), the Reed switch acts as closed and when the door is open (without the magnetic field) the Reed switch acts as an open switch.

Essential points - Identify the switch opration of (Reed Switch) - (Switch on and off) due to the Magnetic field application.
(2 marks)

Marks allocated as follows :
* Identifying the switch operation of the Reed switch (1 mark)
* Switching on/off due to magnetif field. (1 mark)

(ii) Write any two of the following corrections for a total marks of 2

Correction 1 : if (senState = = LOW)

Correction 2 : tone (Buzzer P,262);

Correction 3 : noTone (BuzzerP); (1 ×2 = 2 marks)

(iii)
- LDR (or light sensor) and a Resistor (10 kΩ)
- LDR (or light sensor) to be connected to AO (or any Analog input pin of the Arduino board)

(1 × 2 = 2 marks)

(*b*) (i) B2B
B2C
C2B (1 mark)

(ii) For : SuperMobile can benefit financially by making the profits made by DeliverToday service to themselves and as the sales volumes grow there can be increasing gains.

(1 mark)

Against : (Write one of the following)
- Initial setup cost (vehicles, salaries, fuel, insurance etc.)
- SuperMobile can experience cost overheads per each sale they make and the losses can be large to keep dedicated delivery service if the sales volumes drop.

(1 mark)

(iii) Write one of the following
- Mobile Phones often have End of Life (EoL) and End of Support (EoS) defined by the manufacturer which marks the practical end dates for their sales.
- Mobile phone versions rapidly outdate with the technology and customer preferential features making them difficult to sell after a certain period.
- Certain internal parts (battery, etc.) may not be safe to use after a certain period due to health and safety risks.
- Older models may no longer receive software updates. reducing their functionality over time

(1 mark)

(iv) Allowing customers to give back their old phones for a discount when they purchase a new phone.
Marks allocated as follows :
* collect old phones (1 mark)
* discount for new purchase (1 mark) (2 marks)

(*c*) (i) Agent programs demonstrate autonomous, proactive, reactive, cooperative, learnability and social-ability characteristics which standard software programs are usually not designed with

(1 mark)

(ii) Positive : Generally any consideration that when followed, will help to produce an optimum outcome of agent decisions.

Allocated the marks to any one of the following;

* Avoiding collisions between agents and other objects
* Reducing power consumption
* Following shortest path
* Following least congested path

(1 mark)

Negative : Generally, any consideration that, when avoided, will help to produce an optimum outcome of agent decisions.

(1 mark)

Allocated the mark to any one of the following ;

* Collisions
* Taking more time to deliver goods than the given time (or average time)

(Total Marks - 15)

8. (*a*) 35

(2 marks)

(*b*)

P	O
Q	int
R	str
S	n%2
T	n//2
U	reversed_binary

(0.5 × 6 = 3 marks)

(*c*) (i)

A	n
B	weights
C	res
D	res
E	remainder
F	remainder
G	weight
H	item_selector
I	selected

(1 × 9 = 9 marks)

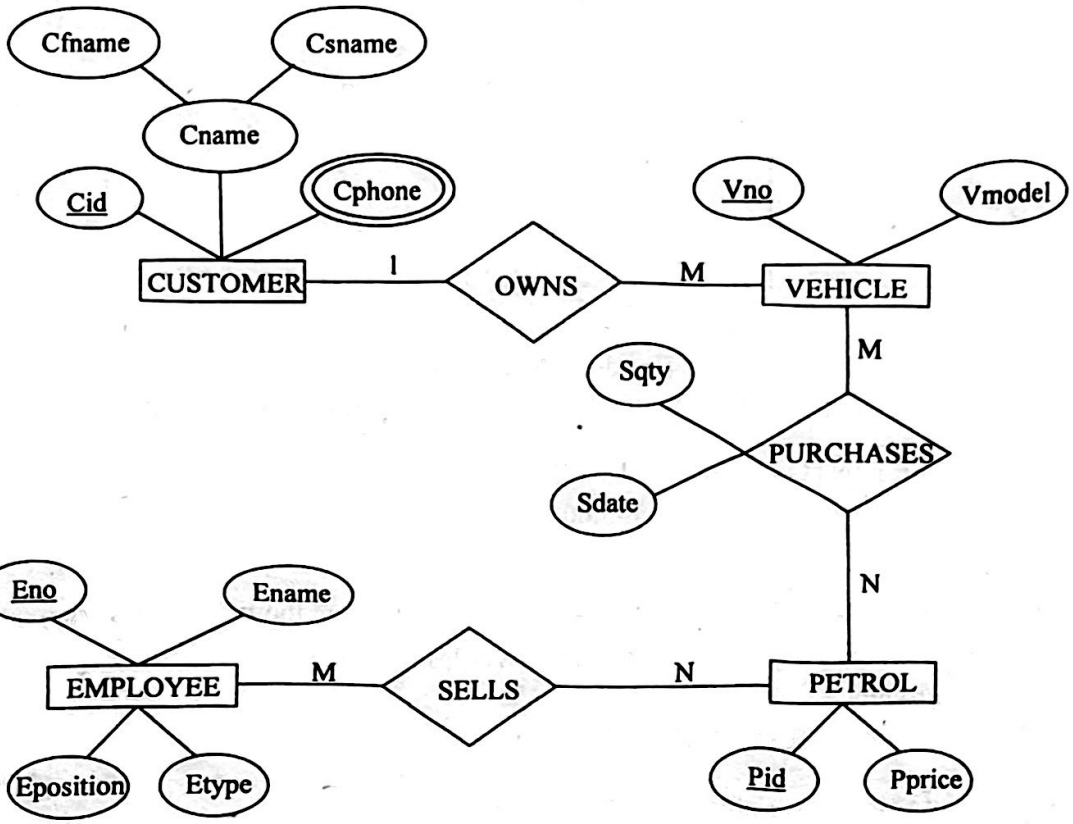
(ii) Write one of the following

- Add two more items each to 'weights', 'values' and 'names arrays'
- Update the arrays to include the new item details.

(1 mark)

(Total Marks - 15)

9. (*a*) (i)



(4 marks)

Marks allocated as follows :

- ✱ If four entities with all attributes correctly listed, key attributes underlined (0.5 marks for each entity) (2 marks)
- ✱ Three relationships with correct cardinality (0.5 marks for each relationship) (1.5 marks)
- ✱ Two attributes of 'purchases' and 'Cphone' multi-valued attribute (0.5 marks)

(ii) CUSTOMER (Cid, Cfname, Csname)

CUSTOMER_PHONE (Cid, Cphone)

VEHICLE (Vno, Vmodel, Cid)

PETROL (Pid, Pprice)

PURCHASES (Vno, Pid, Sqty, Sdate)

EMPLOYEE (Eno, Ename, Eposition, Etype)

SELLS (Eno, Pid)

(4 marks)

Marks allocated as follows.

- ✱ Seven tables with all attributes correctly listed, primary key underlined. (0.5 × 7 = 3.5 marks)
- ✱ Correctly drawn arrows (0.5 marks)

(*b*) (i) 1 NF (First normal form) (1 mark)

Justification :

Result table has a number of partial dependencies and no repeating groups. Each field contains atomic values.

(ii) Remove partical dependencies as follows.
STUDENT (Student ID, Student_Name)
SUBJECT (Subject ID, Subject_Name, Teacher_ID, Teacher_Name, Exam_Date)
RESULTS (Student ID, Subject ID, Mark) (2 marks)

(c) (i)

Product_Name	Wholesale_Price
Sugar	800.00

(1 mark)

(ii) Write any from these two
* INSERT INTO Product (Product_No, Product_Type, Product_Name, Retail_Price, Wholesale_Price) VALUES ('P6', 'Stationary', 'Bag', 755.00, 750.00);
* INSERT INTO Product VALUES ('P6', 'Stationary', 'Bag', 755.00, 750.00):

Note :-
(The semicolon, exact spelling and case of table name and the field names are required.) (1 mark)

(iii) SELECT Product_Type, Product_Name, Wholesale_Price
FROM Product
WHERE Product_Name NOT LIKE 'Bag'; (1 mark)

(Total Marks - 15)

10. (a) Second : load value of variable 'width' into register. (1 mark)
Third : add the values in the two registers (1 mark)

(b) 1's complement of 1010_2 is 0101_2 (1 mark)

$$\begin{array}{r} + \quad 1 \\ \hline 0110 \end{array}$$

2's complement (1 mark)

$$\begin{array}{r} 1100 \\ +0110 \\ \hline \textcircled{1}0010 \end{array}$$

Ignoring this carry (1 mark)

(c) (i) READY (1 mark)
(ii) RUNNING → BLOCKED (1 mark)
(iii) The address of the next instruction to execute in the 'web browser' process is stored in the 'Program Counter' of the PCB of that process.

The address of the next instruction to execute in the 'spreadsheet' process is got from the 'Program Counter' of the PCB of that process (2 marks)

(d) (i) 8 (1 mark)
(ii) 110 0000 0000 0100 (1 mark)
(iii) That frame is occupied by another page (1 mark)
(iv) It informs the operating system that the contents of that page has to be written to secondary storage when that page is evicted from memory. (1 mark)

(e) (i) The block number of the 'index block' (1 mark)
(ii) Contiguous allocation (1 mark)

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(Total Marks - 15)