

ශ්‍රී ජයවර්ධනපුර අධ්‍යාපන කලාපය

Sri Jayawardenapura Education Zone

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය , 2022

General Certificate of Education (Adv.Level) Examination , 2022

තෙවන වාර පරීක්ෂණය 2022

13 ශ්‍රේණිය

Third Term Test 2022

Grade 13

තොරතුරු හා සන්නිවේදන තාක්ෂණය

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

Part A

(1)

a) i. සබැඳි ආවයනය , සුවක ආවයනය (ලකුණු 1)

ii. දෘඩාංග දෝෂ, මෘදුකාංග දෝෂ, පරිශීලක අත්වැරදීම්, හිතාමතා සිදු කරන හානි ආදී පිළිතුරු (ලකුණු 1)

b) i. මෘදුකාංග අතුරු බිඳුම, දෘඩාංග අතුරු බිඳුම (ලකුණු 1)

ii. මධ්‍ය කාලීන නියමාකරණ (ලකුණු 1)

iii. ක්‍රියායන ගණනාවකට තනි සකසනය බෙදා දීම

ඛණ්ඩ කාර්යය සිදු කිරීම

ක්‍රියායන පාලන ඛණ්ඩය තුළ ක්‍රියායන සංක්‍රාන්ති විස්තර සටහන් කිරීම ආදිය (ලකුණු 1)

c) i. -භෞතික මතකයේ ධාරිතාවයට වඩා වැඩි ධාරිතාවයක වැඩසටහන් විවෘතව තබා ගැනීම

-යම් වැඩසටහනකට අවශ්‍ය කොටස් පමණක් භෞතික මතකයට ලබා ගැනීම

-වරකට වැඩසටහන් කිහිපයක් එකවර මතකයේ මට්ටමයේ රඳවා ගැනීම (ලකුණු 1)

ii. A - පිටුකරණය

B - රාමු

C - පිටු

(ලකුණු 1.5)

iii.

අ) අත්‍යවශ්‍ය මතක යොමුව = බිටු 26

පිටුවක ධාරිතාව = $4MB = 2^2 + 2^{20}$

=බිටු 22

=26-22

= බිටු 4

(ලකුණු 1.5)

ආ) භෞතික මතක ධාරිතාව = $32 MB = 2^5 + 2^{20} =$ බිටු 25

අනුලම්භය = බිටු 22

=25-22

= බිටු 3

(ලකුණු 1)

2)

(a) USE school_db;

```
CREATE TABLE Teacher(  
    NICNo CHAR(10) NOT NULL,  
    TeacherName VARCHAR(30),  
    Gender CHAR(1),  
    DOB DATE,  
    MobileNo CHAR(10),  
    Salary FLOAT,  
    PRIMARY KEY (NICNo));
```

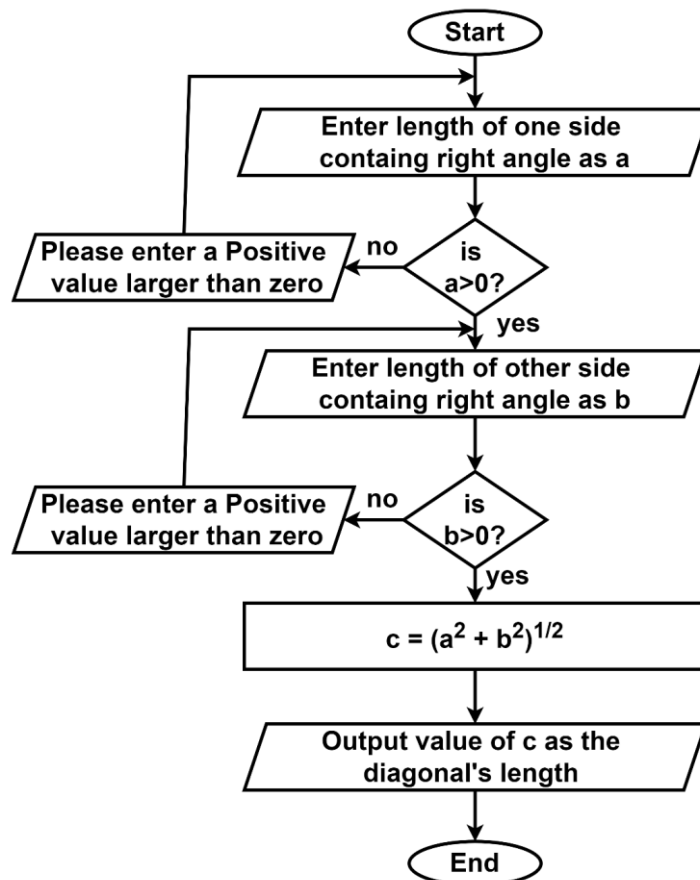
(b) ALTER TABLE Teacher
ADD AppointmentDate DATE;

(c) INSERT INTO Teacher
VALUES ('780360627V', 'Mr. Dimuthu Bandara', 'M', '1978-02-05',
'0717407916', 24500.00);

(d) SELECT *
FROM Teacher
WHERE Gender='M';

(e) UPDATE Teacher
SET Salary = Salary*1.15;

3)



- is a>0? 1 mark and for its 'yes' and 'No' Positioning 1 mark
- is b>0? 1 mark and for its 'yes' and 'No' Positioning 1 mark
- $c = (a^2 + b^2)^{1/2}$ 1 mark

Convert the flowchart done in above part (i) in to a python code

```
a = int(input("length of one side containing the right angle :"))
while a<=0:
    print ("Enter a positive value which is not a zero")
    a = int(input("length of one side containing the right angle :"))
b = int(input("length of other side containing the right angle :"))
while b<=0:
    print ("Enter a positive value which is not a zero")
    b = int(input("length of other side containing the right angle :"))
c = (a*a + b*b)**0.5 #c = (a**2 + b**2)**0.5
print("Length of the diagonal is ",c)
```

or any other suitable answer

(5 marks)

4)

a) පහත ප්‍රතිදානයට අදාළ HTML කේත ඛණ්ඩයේ හිස්තැන් සුදුසු පරිදි පුරවන්න.

Subjects
d. ICT
e. Physics
f. Chemistry

< ><h3>Subjects</h3></>

<ol type = 'a' start = '4'>

ICT

Physics

Chemistry

b) පහත ප්‍රතිදානයන්ට අදාළ HTML කේතය ලියන්න.

i. වෙබ් පිටුව මත දර්ශනය වන “Open the Document” යන අධිසන්නිධාන පාඨය මත click කළ විට “Course Details.html” ලේඛනය නව කවුළුවකින් දර්ශනය වීම

`<a href = “Course Details.html” target = “_blank”> Open the Document </a>`

ii. වෙබ් පිටුවේ ඇති eschool.jpg යන ග්‍රාෆික්ස් මත click කළ විට එම පිටුවේම `https://www.Courses.eschool.gov.lk` යන වෙබ් අඩවිය විවෘත වීම

`<a href = “https://www.Courses.eschool.gov.lk” target = “_self”>`

`<img src = “eschool.jpg” /> </a>`

**** Highlighted part is optional** පහත PHP කේතයේ ප්රතිඵලය කුමක් ද ?

c) `<?php`

```
$user = array("Shashika", "Rashika", "Sahan", "Nashira");  
for ($x=0; $x < count($user); $x++) {  
    if ($user[$x] == "Rashika") continue;  
    printf ($user[$x]);  
}  
?>
```

ShashikaSahanNashira

Part B

5)

a.)

P	Q	R	P'	Q'	R'	$P \oplus Q' \oplus R$	PQR'	$(P \oplus Q' \oplus R) \oplus (PQR')$	$P'Q'R$	$((P \oplus Q' \oplus R) \oplus (PQR')) + (P'Q'R)$	Z
0	0	0	1	1	1	1	0	1	0	1	0
0	0	1	1	1	0	0	0	0	1	1	0
0	1	0	1	0	1	0	0	0	0	0	1
0	1	1	1	0	0	1	0	1	0	1	0
1	0	0	0	1	1	0	0	0	0	0	1
1	0	1	0	1	0	1	0	1	0	1	0
1	1	0	0	0	1	1	1	0	0	0	1
1	1	1	0	0	0	0	0	0	0	0	1

b.)

$\begin{matrix} PQ \\ R \end{matrix}$	$\begin{matrix} P'Q' \\ 00 \end{matrix}$	$\begin{matrix} P'Q \\ 01 \end{matrix}$	$\begin{matrix} PQ \\ 11 \end{matrix}$	$\begin{matrix} PQ' \\ 10 \end{matrix}$
$\begin{matrix} R' \\ 0 \end{matrix}$	0	1	1	1
$\begin{matrix} R \\ 1 \end{matrix}$	0	0	1	0

c.) SOP

$\begin{matrix} PQ \\ R \end{matrix}$	$\begin{matrix} P'Q' \\ 00 \end{matrix}$	$\begin{matrix} P'Q \\ 01 \end{matrix}$	$\begin{matrix} PQ \\ 11 \end{matrix}$	$\begin{matrix} PQ' \\ 10 \end{matrix}$
$\begin{matrix} R' \\ 0 \end{matrix}$	0	1	1	1
$\begin{matrix} R \\ 1 \end{matrix}$	0	0	1	0

$$Z = QR' + PR' + PQ$$

d.) POS

$\begin{matrix} PQ \\ R \end{matrix}$	PQ 00	PQ' 01	P'Q' 11	P'Q 10
R 0	0	1	1	1
R' 1	0	0	1	0

$$Z = (P+R') \cdot (Q+R') \cdot (P+Q)$$

e.) both circuits are suitable

According to the simplified SOP and POS Boolean expressions, each needs 6 logic gates to implement the circuit(SOP – 3 AND, 2 NOT, 1 OR/ POS – 3 OR, 2 NOT, 1 AND). Therefore both can be used to implement the simplified circuit.

(6)

(a) Star topology (1 Marks)

- As no data collisions can occur
- Can be done without disturbing entire network
- If one cable or device fails then all the others will still continue to work (1 Marks)

(b)

unit	Network ID	Broadcast ID	Subnet mask	No. of Nodes	Usable IP Address Range
Finance	192.248.16.0	192.248.16.63	255.255.255.192	64	192.248.16. 1 192.248.16.62
HR	192.248.16.64	192.248.16.79	255.255.255.240	16	192.248.16.65 192.248.16.78
IT Unit	192.248.16.80	192.248.16.111	255.255.255.224	32	192.248.16.81 192.248.16.110
Marketing	192.248.16.112	192.248.16.239	255.255.255.128	128	192.248.16.113 192.248.16.238

unit	Network ID	Broadcast ID	Subnet mask	No. of Nodes	Usable IP Address Range
Finance	192.248.16.0	192.248.16.63	255.255.255.192	64	192.248.16. 1 192.248.16.62
HR	192.248.16.64	192.248.16.95	255.255.255.224	32	192.248.16.65 192.248.16.94
IT Unit	192.248.16.96	192.248.16.127	255.255.255.224	32	192.248.16.97 192.248.16.126
Marketing	192.248.16.128	192.248.16.255	255.255.255.128	128	192.248.16.129 192.248.16.254

- Marks allocated as follows.

6 marks for all 20 highlighted cells correct

5 marks for maximum 16,17,18,19 highlighted cells correct

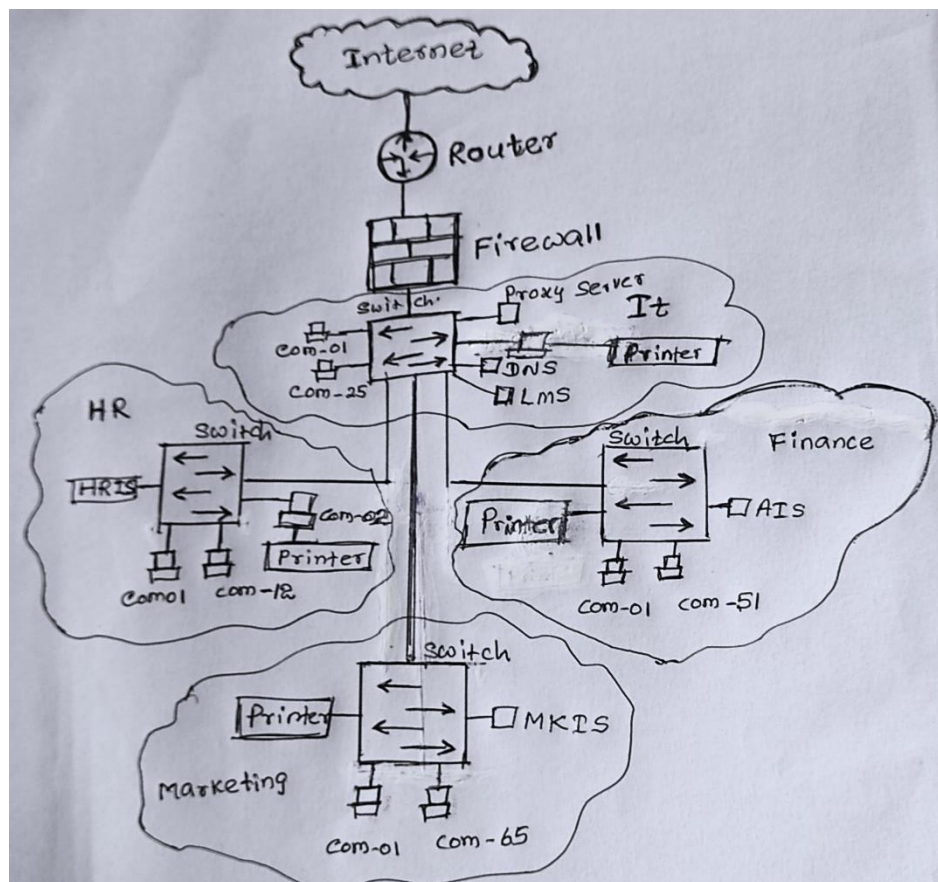
4 marks for maximum 12,13,14,15 highlighted cells correct

3 marks for maximum 8,9,10,11 highlighted cells correct

2 marks for maximum 4,5,6, 7 highlighted cells correct

1 marks for maximum 1,2,3, highlighted cells correct

(c)



1 Marks for each:

A : Internet –Router- Firewall- IT switch link

B: Connecting HR, Finance , and Marketing switches to the IT Switch

C : Connecting Proxy and the DNS servers to the IT switch

D: Connecting AIS, HRIS,LMS, and MKIS servers to Finance, HR, IT, unit and Marketing Switches respectively

E: Connecting the computers to the Switches in each department. And Connecting the network printers , non - network printers

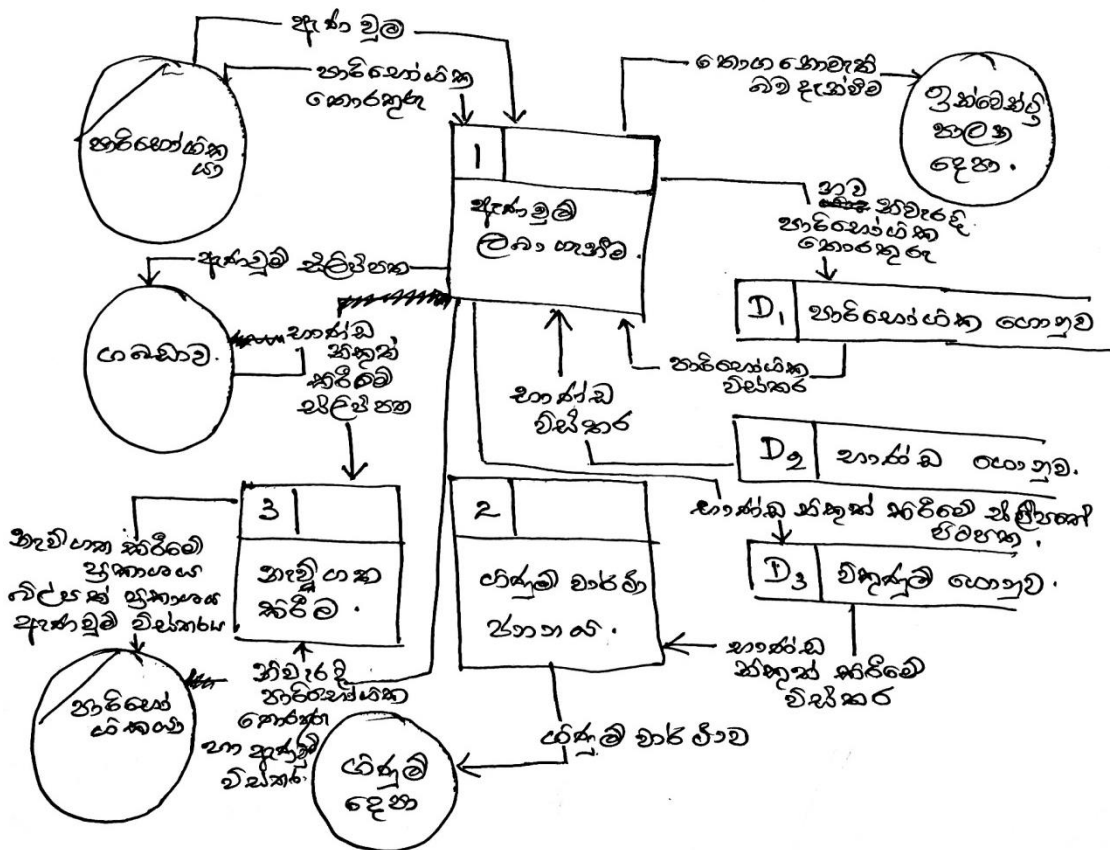
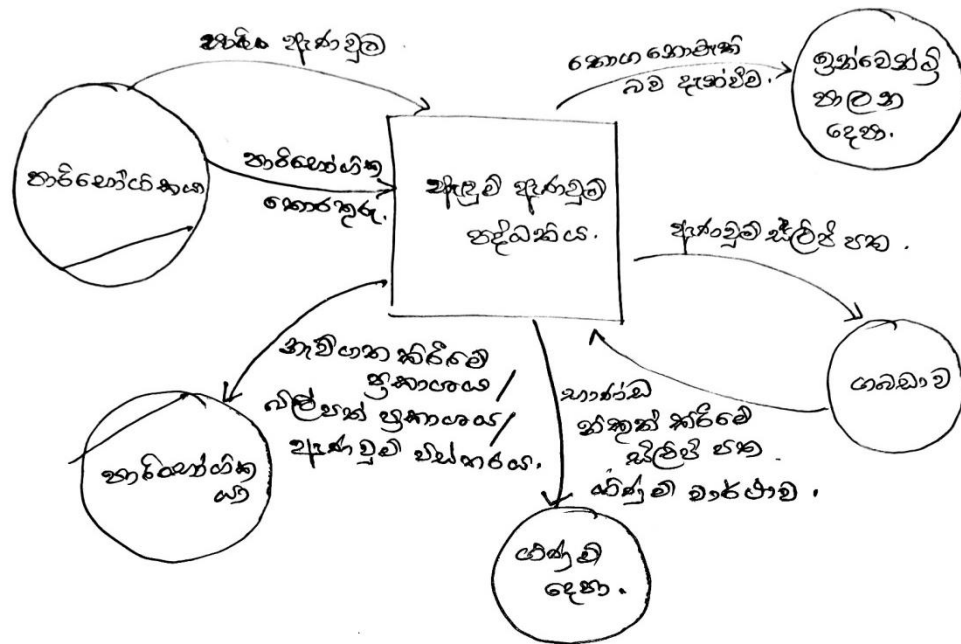
(d) Marks allocated as follows.

1010011 - one bits 4 (1 Marks)

01010011 or **10100110** (1 Marks)

Parity Bit

(7)



1 mark – system with correct symbol

3 marks- 3 data stores

4 marks – 4 entities

3 marks – at least 3 processes

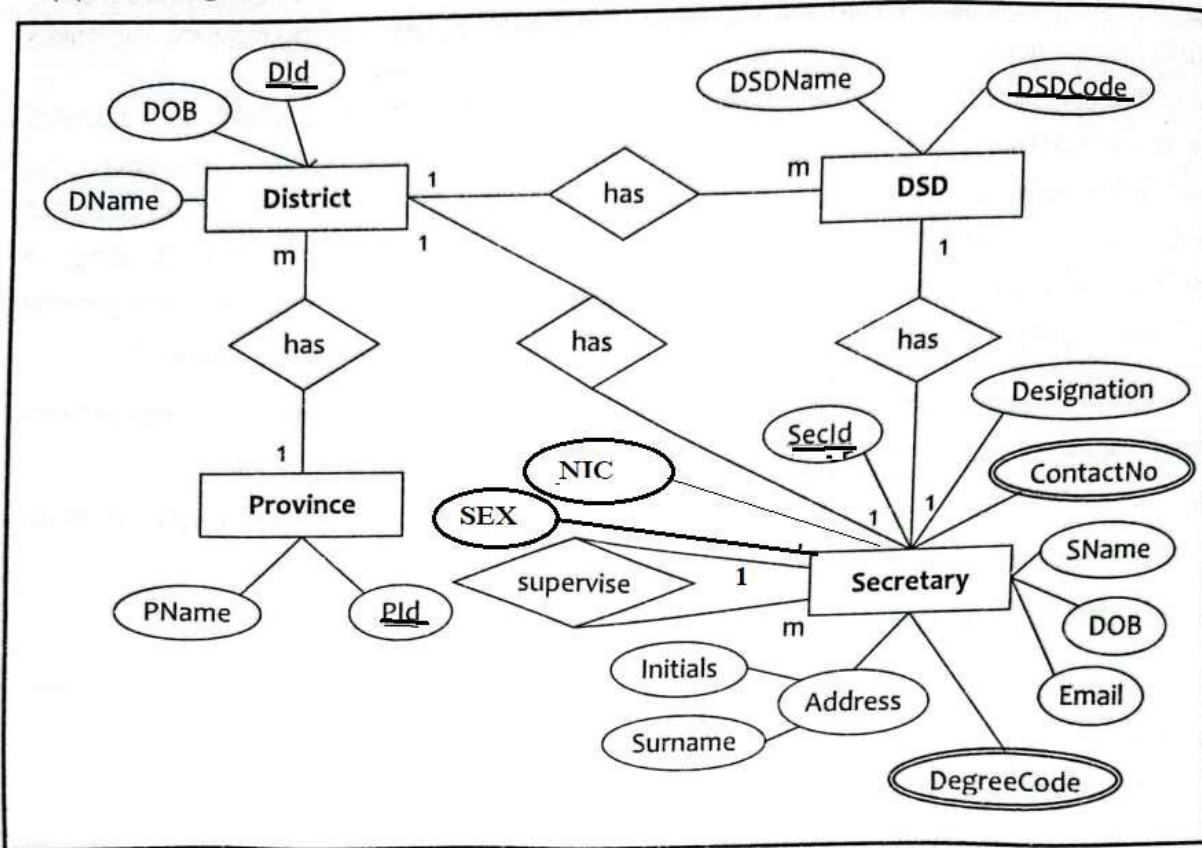
2 marks - 6 data flow or above

2 marks – correct data flows

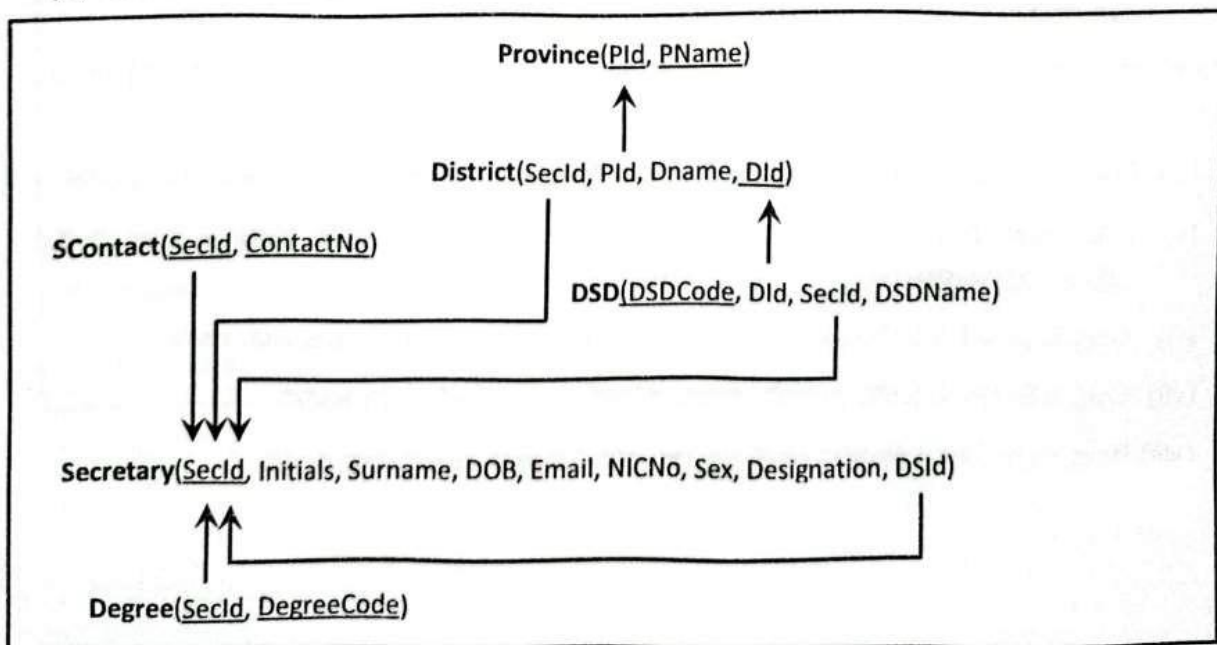
(1 mark -other 4 or 5 data flow)

(8)

(a) ER Diagram



(b) Relational Model



3.

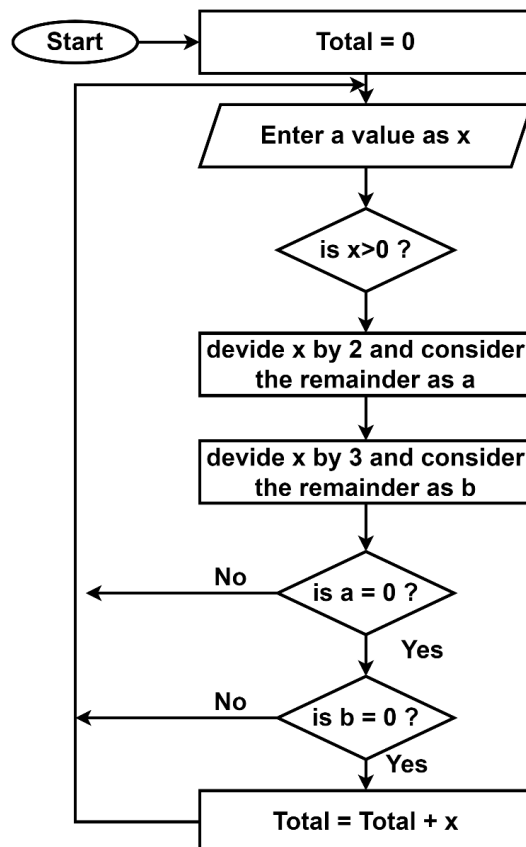
```
SELECT DName, Initials, Surname, ContactNo
FROM District d, Secretary s, SContact c
WHERE d.SecId=s.SecId AND s.SecId=c.SecId;
```

4. 2NF

(II) **PurchaseOrder**(PurOrder, PurOrdDate, EmpCode, SupCode)

Supply(SupCode, SupName)

9) a)



(5 marks)

(b) (i) 11 (2marks)

(ii) (2.5 marks)

- This algorithm will take year, month and date as three inputs.
- Add those values together and make a total.
- Convert the total in to a string
- separate numbers in the total value
- add those numbers together and assign it to variable x to be used as output.

(iii) Develop a python program to implement the above algorithm

```
x = 0
i = 0
y = int(input("Enter Birth year : "))
m = int(input("Enter Birth Month : "))
d = int(input("Enter Birth Day : "))
total = y+m+d
s = str(total)
L = len(s)
for i in str(total):
    x = x + int(i)
print ("your lucky number is : ",x)
```

or any other suitable answer

(5.5 Marks)

10)

a) i) What is the relevant e-business type for receiving membership fee by PPA online?

B2C

ii) a) Name the revenue model and any other alternative revenue model use by this e-commerce site for the process mentioned in (i) above.

Sales/ service revenue model, Advertising revenue model

iii) a) The PPA has selected the “Payhere” as the payment gateway which required for online payment. What is the applicable e-business type between payment gateway and PPA?

B2B

(b) Name a revenue model used by the payment gateway for the process mentioned in (a) above.

Transaction fee revenue model.

iv) The PPA pays \$270.00 per year, online to the web hosting company that hosts this e-commerce site. What is the relevant e-business type among PPA and web hosting company.

B2B

v) State an advantage and a disadvantage of computerizing the membership process for each of the following parties

- Past Pupil Association

- Advantage – Membership providing process become efficient, can analyze and utilize data efficiently, can generate essential reports easily
- Disadvantage – Initial cost of establishment of the system, Annual hosting charges, System maintenance problems. System customization charges.
- Past pupils who expect to get the membership
 - Advantages - Membership obtaining process become efficient, past pupils live in remote areas, other countries even able to get the membership. Can save their time.
 - Disadvantages – Unavailability of online payment methods. Lack of knowledge in online transactions etc.

vi) Consider this statement in the description above “Verifies the validity of documents using artificial intelligence” State a method that can be provide artificial intelligence to this computer program that checks the validity of documents.

Artificial Neural Networks

b)

