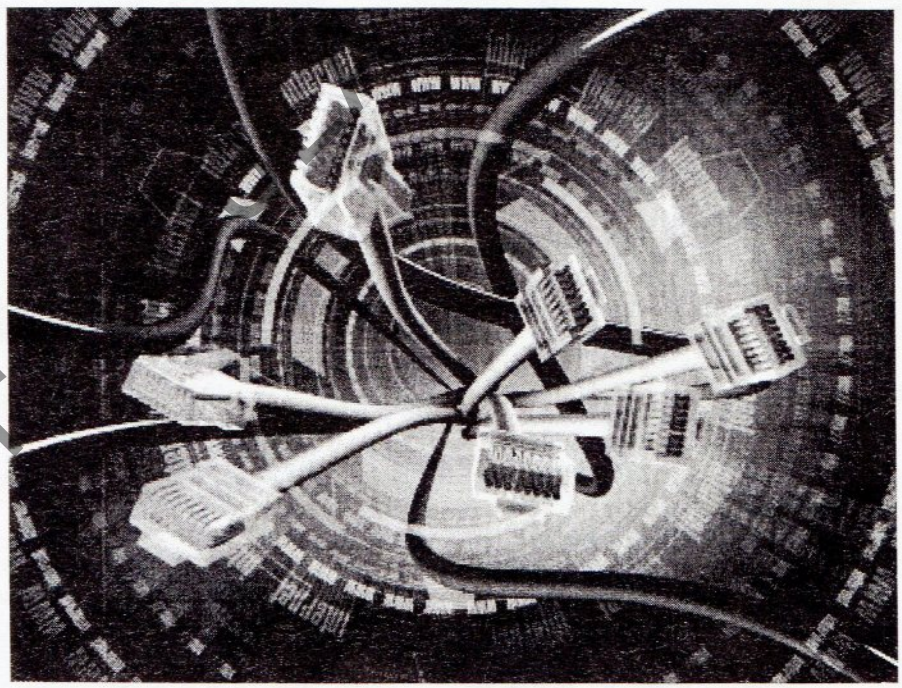
GCE (O/L) Examination 2012

Scheme of Marking

Information and Communication Technology (80)



Paper I - MCQ Answers

1	4	21	3
2	2	22	2
3	1	23	4
4	4	24	4
5	3	25	4
6	4	26	3
7	4	27	4
8	2	28	1
9	2	29	1
10	3	30	3
11	3	31	1
12	1	32	1
13	2	33	3
14	3	34	3
15	1	35	2
16	1,2,3	36	2
17	3	37	2
18	1	38	3
19	3	39	4
20	2	40	4

Paper II

Special Notes:

(./ ./) indicate only one of the options included in square brackets are considered as one answer

{ } indicates that words inside are optional. Even without any of the options in side brackets full marks will be awarded

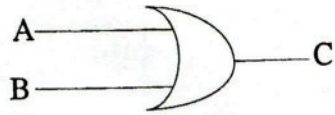
[..] indicates marking guidelines

1	
(i)	Convert the binary number 10101001 into hexadecimal. Show your computations. 10101001_2 1010 1001 {10 9} $A9_{16}$ [Note: Should indicate the 'base' in the final answer] Or 10101001_2 -> 169_{10} [note: should show computation, i.e. $1x2^0+0x2^1$] 169_{10} -> $A9_{16}$[should show computation, i.e. division by 16 repeatedly] Marks awarded only for correct and complete computation and final answer with 'base' **[1 mark for computation + 1 mark for answer = 2 marks]**

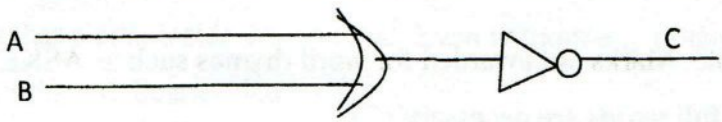
(ii)	Name a coding system used to represent characters (e.g.: @, 2, A, .) in computers. (ASCII / American Standard Code for Information Interchange /EBCDIC /Extended Binary Coded Decimal Interchange Code / UNICODE) Note: Marks not awarded for word rhymes such as ASKEY in English, Acronym or full words are necessary **[2 marks]**
(iii)	List **two** advantages of a computer network. Data/file sharing communication/messaging hardware (e.g. printer) sharing / resource sharing resource sharing software sharing internet access sharing security through centralized software management centralized software management centralized hardware management cost reduction (through sharing / saving electrical power) **[1 mark each x 2 = 2 marks]**

(iv) Consider the truth table given below

input		output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	0



Modify the given logic circuit by inserting a **single** logic gate to represent the above truth table.



No marks for NOR gate

[Note: Input and output require correct labeling]

[2 or 0 marks]

(v) Consider the following two columns:

Column 1	*Column 2*
A.	translates a web address (URL) to the relevant IP address.
B.	is a service of the Internet.
C.	uniquely identifies each computer on the internet.
D.	separates the user name and domain name of an email address.
E.	displays formatted web pages on a screen.

Select and write down suitable terms for A, B, C, D and E from the following list:

@ symbol, Domain Name Server (DNS), IP Address, Web Browser, World Wide Web

A – Domain name server DNS

B- World wide web

C- IP address

D - @ symbol

E – Web browser

[Note: If table drawn and correct answer indicated with arrows accept]

[5 correct = 2 marks

3-4 correct= 1.5 marks

2 correct= 1 marks

1 correct= 0.5 marks]

[total 2 marks]

(vi)

Consider the following sentences:

A .(A). port in a computer can be used to connect external devices such as external hard drives, printers, mice and scanners.

The .(B). port can be used to connect the computer to internet.

The .(C). port is used to connect a monitor to a computer.

The .(D). port is used to connect speakers to a computer.

Write appropriate terms from the list given below for labels (A), (B), (C) and (D)

- line out
- network
- PS/2
- USB
- VGA

A – USB

B - network

C - VGA

D – Line out

[0.5 each x 4 = 2 marks]

(vii)

Copy the following two tables A and B to your answer sheet and draw arrows between matching items of table A and table B.

Table A
Computer monitor
CPU
Digital Camera
Hard disk
Keyboard

Table B
Computations
CRT, LCD, LED
QWERTY
Read/write head
Image capture

Computer monitor - CRT, LCD, LED
CPU - Computations
Digital camera- Image capture
Hard disk - Read/write head
Keyboard – QWERTY

Marks awarded if table rearranged to match terms or correct arrows indicated.

[4- 5 correct = 2 marks

3 correct= 1.5 marks

2 correct= 1 marks

1 correct= 0.5 marks]

[total 2 marks]

(viii)

A vehicle with two doors (X and Y) has an indicator light (Z) to show whether the two doors are properly closed. When one or both doors are open, the light will be 'on' When both doors are closed, the light will be 'off'

(a) Construct a truth table for the above scenario using the following assumptions:

- For doors: 'closed' = '0' and 'open' = '1'
- For the indicator light: 'off' = '0' and 'on' = '1'

(b) What is the **single** logic gate that represents the above scenario?

(a)

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	1

Note: Ignore the order of X and Y values and check accuracy of X,Y and corresponding Z

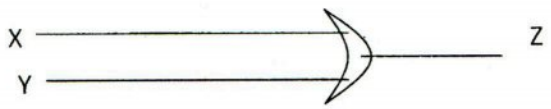
[completely correct truth table = 1 mark or 0 marks]

(b)

OR gate

or

correct symbol



[Note: Labeling of inputs optional]

[1 mark]

(ix)

Consider the following four statements:

- In video editing software, the ..(A).. feature organizes and controls movie contents over time.
- The ..(B).. can be used to insert sound into an animation file.
- The ..(C).. allows to access and change the most commonly used attributes of a graphic animation.
- The ..(D).. tool trims images on a graphics editing software.

Write appropriate terms from the list given below for labels (A), (B), (C) and (D)

(canvas, crop, import, layer, magic wand, property inspector, timeline)

(ix)

A- Timeline

B- import

C- property inspector

D- crop

[0.5 each x 4 = 2 marks]

(x) A program is required to perform ten divisions. The program accepts two numbers as input at each time. If the divisor (e.g., if 1 is divided by 2, the divisor is 2) is not zero, then the division is carried out and the answer is printed. If the divisor is zero, then "division by zero" is printed. The following pseudo-code (incomplete) represents this scenario.

Copy the pseudo-code exactly as given, and complete the blanks.

```
Begin
    For (counter=.          to          .)
                number_1
                number_2
        if (.       =0) then
            print "          "
        else
            answer =
            print
        endif
    Next counter
End
```

```
Begin
                                    for (counter=.....1..... to    ..10.....)  [0.5 marks]
        .....input/get/read/enter..... number_1
        .....input/get/read/enter..... number_2
                                                                  [both inputs correct 0.5 marks]
        if (  ..number_2.... =0) then
            print     ....division by zero....."
                                                                  [Both correct 0.5 marks]
        else
            answer =   .....number_1/number_2.....
            print     ....answer.....
                                                                  [Both correct 0.5 marks]
        endif
    next counter
End
```

OR

Begin

for (counter=.....1..... to ...10.....) **[0.5 marks]**

.....input..... number_1

..... input..... number_2

[both inputs correct 0.5 marks]

if (...number_1.... =0) then

print `` ...division by zero....."

[both correct 0.5 marks]

else

answer = ...number_2 / number_1.....

print .....answer.....

[Both correct 0.5 marks]

endif

next counter

End

Note:No partial marks , No additions should be made to the pseudocode, Number of repetitions of the for-loop should be '10'

2.

The following spreadsheet segment shows the distribution of dengue cases reported in 18 selected cities for three months (*source: www.epid.gov.lk*).

	A	B	C	D	E	F
1		Distribution of Notification -Dengue Cases by Month				
2		City	July	August	September	
3	1	Anuradhapura	26	34	25	
4	2	Badulla	47	40	35	
5	3	Batticaloa	11	21	7	
6	4	Colombo	1314	1210	493	
7	5	Galle	208	217	65	
8	6	Gampaha	969	884	464	
9	7	Hambantota	48	78	29	
10	8	Jaffna	26	36	41	
11	9	Kalutara	344	321	151	
12	10	Kandy	287	345	133	
13	11	Kegalle	385	315	173	
14	12	Kurunegala	378	360	302	
15	13	Matara	186	222	141	
16	14	N Eliya	30	30	21	
17	15	Polonnaruwa	22	30	12	
18	16	Puttalam	93	142	229	
19	17	Ratnapura	620	630	306	
20	18	Trincomalee	8	13	6	
21		Total by month				
22		Maximum cases				
23						

Use the above spreadsheet segment to answer the following questions:

(i) Write down the cell range which represents the data for the month of July in all 18 cities.

(ii) Write the formula with a **single function** that has to be entered in cell C21 to display the total number of cases in all 18 cities for the month of July

(iii) Write the formula with a **single function** that has to be entered in cell C22 to display the maximum number of cases among all 18 cities for the month of July

(iv) Assume that a formula with a **single function** required to obtain the average value of Dengue cases for the month of July is entered in the cell C23.

If this formula is copied to cell D23 what will be the **formula** contained in cell D23?

(i) c3:c20

[2.5 marks]

or

C3 (to .. - ->) C20

[2 marks]

(ii)	=sum(c3:c20) or +sum(c3:c20) **[2.5 marks]**
(iii)	=max(c3:c20) or +max(c3:c20) **[2.5 marks]**
(iv)	=average(d3:d20) or + average(d3:d20) **[2.5 marks]**

3

The following three tables are a part of a school management information system that stores details of teachers and their subjects. One teacher may teach more than one subject and one subject may be taught by more than one teacher.

Teachers

Teacher ID	Name
1111	Saman Silva
2222	Mallika Perera

Subjects

Subject Code	Subject Name
Eng10	English
Sin09	Sinhala
Sci10	Science

Teacher_Subject

Subject Code	Teacher ID
Eng10	1111
Sin09	2222
Sci10	1111
Sci10	2222

(i) List **two** primary keys together with their corresponding table names.

(ii) Briefly explain **one** disadvantage that would occur if a single table is used instead of three tables for storing the data.

(iii) What is meant by a foreign key? Illustrate your answer using the above tables.

(i)	Teachers {table} -> Teacher ID Subjects {table} -> Subject Code Teacher Subject {table} -> Teacher ID + Subject Code **[2 marks x 2 = 4 marks]** Note: correct spelling is required for both corresponding field names , table names. Marks awarded with or without space in field names.
(ii)	Data redundancy would occur/duplication of data,/repeating data/data anomalies in (update/delete/insert) This would lead to excess storage and inefficient search/add/modify delete processe(s). **[1 mark for disadvantage+ 1 mark for explanation=2 marks]**
(iii)	A foreign key is a column or columns in one table, who's values are the same as the primary key in another table. {This creates a relationship between the tables/Foreign key relate tables} e.g.Teacher ID field for Teacher Subject table Subject Code for Teacher Subject table **[2 for definition + 2 for example = 4 marks]** Marks awarded if lustrations are given by drawing the given tables with illustrations

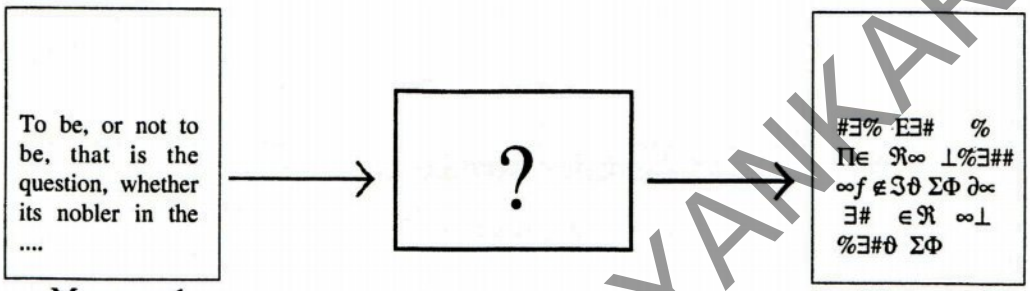
4

(i) Consider the URL, http://www.schoolnet.lk
Write down the protocol, service and the top level domain name.

(ii) Online shopping can be defined as the act of purchasing products or services over the internet.
Briefly explain **two** benefits of online shopping.

(iii) A person says that his credit card details have been stolen and used by some one else after online shopping.
Suggest **three** safety measures that he can take to prevent such unauthorized transactions.

(iv) In the following diagram, Message 2 is the equivalent of Message 1. A certain technology is used to convert Message 1 to an unreadable format which can only be read by the intended recipient. What would you call this technology shown in the middle-box with a"**?**" ?



Message 1 Message 2

(i)

Protocol http or http:/

Service www or www

Top level domain lk or .lk

[1 mark x 3 = 3 marks]

(ii)

- Can purchase goods and services at reduced price due to reduction of overheads (such as shop space/ electricity/ staff salaries, etc)
- can buy 24 hours 365 days /any time
- Buy goods from anywhere {national and international market}
- Digital products can be obtained instantly {by downloading},
- No transport/parking problems for customer that are usually associated with (traditional/brick-and-mortar) shopping

[1 each x 2 = 2marks]

(iii)	• Use a Credit Card with Online Fraud Protection • Only use Secure Websites (https) / Do not to use your credit card at unknown un-trusted websites • Shop online from Well-Known companies/Check company reputation with First Time Purchases/ Check for Contact Details • Print and save record of online transactions • Checkout the terms of the 'deal' of the purchase • Know exactly what items you have purchased **[1 each x 3 = 3 marks]**
(iv)	Encryption **[2 marks]** or Encoding **[1 marks]**

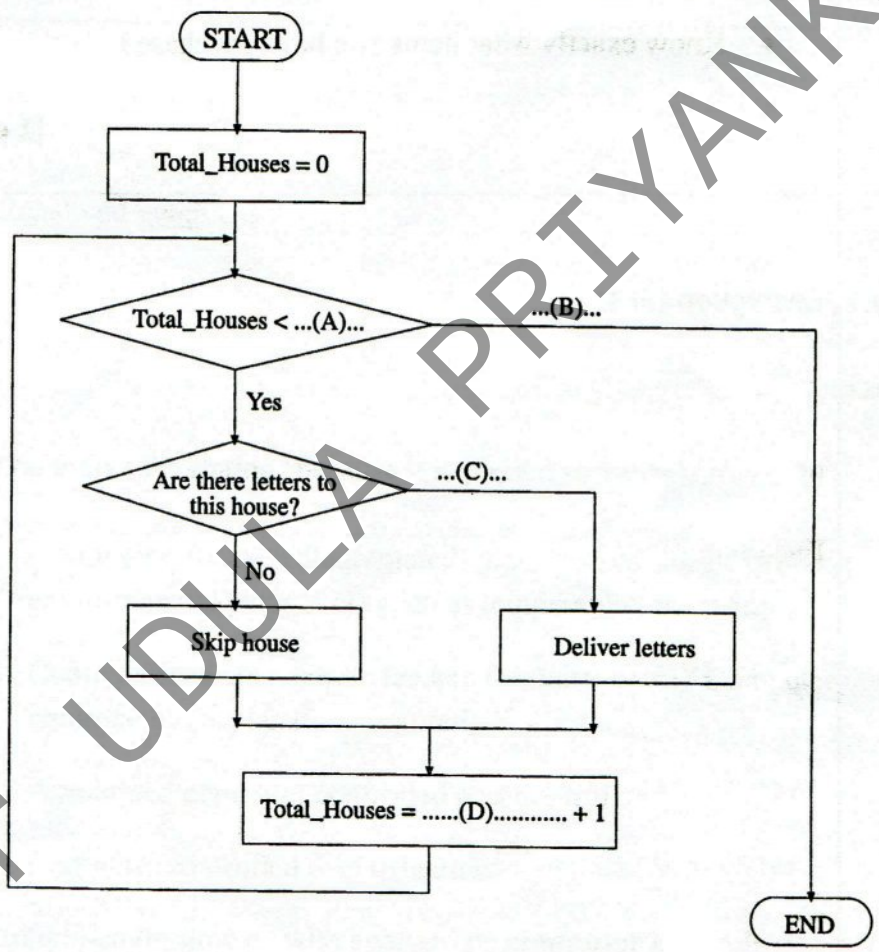
5

(i) Draw the relevant flowchart segment to present the following scenario:

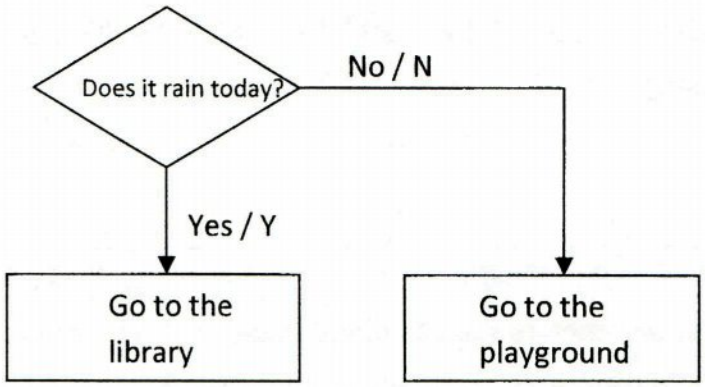
if it rains today then
    go to the library
else
    go to the playground

(ii) A postman is required to deliver letters to one hundred and fifty (150) houses. He collects the mail bag from the post office and travels from the first house to the last house. Every house has a letter-box. If there are letters to a particular house he delivers them to the letter-box, otherwise (i.e., if there is no letter) he skips the house.

The following flowchart represents the above scenario. Write down the appropriate labels to fill the blanks (A), (B), (C) and (D). Your answer should use the exact variable names as in the flowchart.



5(i)



[decision box with arrowheads and correct labels 2 marks + 'go to library' process box 1 mark + 'go to playground' process box 1 mark = 4 marks]

(ii)

A – 150 **[2 marks]**

B no **[1 mark]**

C – yes **[1 mark]**

D – Total Houses **[2 marks]**

Note: Correct variable name is essential

6.

(i) Telemedicine allows investigation, monitoring and management of patients from remote locations.

(a) List **one** advantage of telemedicine in addition to the remote accessibility

(b) List **one** challenge in using telemedicine.

(ii) One of your friends offers a copy of an unlicensed software CD to you. Do you agree or disagree? Justify your answer.

(iii) Briefly explain **two** examples for computer controlled systems in agriculture.

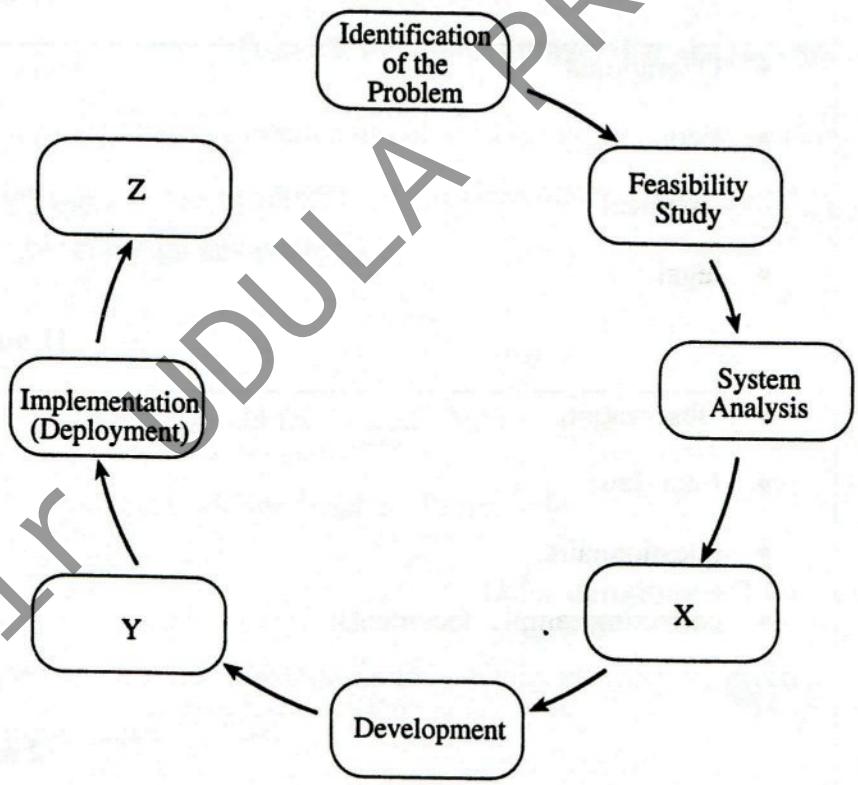
(iv) "e-learning helps one to learn at his/her own pace (speed) compared to traditional classroom-based learning." Do you agree with this statement? Briefly explain your answer.

6 (i) **(a)**	(Availability of more expertise /Remote surgery/ Low cost due to less travelling to access foreign or distance expertise/Doctor can serve many patients in different locations at a time) **[1 mark]**
(b)	(Legal issues/ cost of equipment/ transmission and connectivity charges/obtaining patient's medical parameters such as blood pressure, temperature/payment methods will be complicated / lack of touch and feel.) **[1 mark]**
(ii)	No **[1 mark]** It is illegal and unethical **[1 mark + 1 marks = 2 marks]** **[total 3 marks]** Note: no marks for stating 'because it is pirated software'
(iii)	• (Computer controlled/automated) greenhouses (for controlling environmental parameters such as temperature, humidity) • Computerized concentrate feeders for dairy-cows / Computer controlled equipments (explanation required) • Automated/computer controlled pest control • Computer controlled drip irrigation agricultural environments with appropriate **computer controlled** examples. **[1 mark x 2 = 2 marks]** Note: no marks awarded for examples that uses only information systems in agriculture. Computer controlled examples are required.

(iv)	Yes. **[1 mark]** (Could access material and learn from anytime-anywhere Could adjust time to learn according to learner's convenience/ Could adjust learning pace according to learner's need or ability) **[any one points of the above : 2 marks]** **[Total = 3 Marks]**

7 (i) Piumi tells Saman that she found an interesting web article on the history of Internet. Although Piumi could remember the title of the article as "Evolution of the Internet", she does not remember the web address of the site. Write down the steps that Saman should follow in order to find this article from the internet.

(ii) Udara is planning to implement a new library information system for his school using the Systems Development Life Cycle (SDLC) methodology as shown in the following diagram:



(a) Write the names of the phases X, Y and Z.

(b) List **two** types of feasibility that he needs to assess during the Feasibility Study phase.

(c) List **three** methods that Udara could use to collect relevant information during the System Analysis phase.

7(i)	{Open a browser} Find a search engine Search using keywords or title Select the appropriate link Or Go to Piumi's computer search the appropriate browsing history find the appropriate link **[1 mark x 3 = 3 marks]**
(ii) **(a)**	x- design system design y testing z maintenance **[1 mark x 3 = 3 marks]**
(b)	• Operational • Economic • technical • legal **[1 marks x 2 = 2 marks]**
(c)	• Observations • Interviews • questionnaire • collecting sample documents. **[1 answer = 1 mark** **2 answers = 1.5 marks** **3 answers = 2 marks]**