

G.C.E.(A/L) Examination - 2013

NATIONAL EVALUATION & TESTING SERVICE
DEPARTMENT OF EXAMINATION - SRI LANKA

20 - Information & Communication Technology

Marking Scheme

R.M.K. Jayasinghe

AL/N/20/S/10

3423

ரஶகஶயி

அந்தரங்கமானது

ஶ்ரீ லுகா விஶாஶ டேபார்தமேன்ஶு

இலங்கைப் பரீட்சைத் திணைக்களம்

புதித ஈடுதீதி ஶா பரீக்ஷலு ஶேலல

தேசிய மதிப்பீட்டிற்கும் பரீட்சித்தலுக்குமான ஶேவை

ஈ.புல.ஶ. (ஈ.பேல) விஶாஶ 2013

ஶ.புல.த.(ஂ.தர)ப் பரீட்சை 2013

விதய ஶாடம் }

விதய ஈடுதீதி பரீட்சை இலக்கம் } 20

லுஷு டீதீ பரீபாலி - I பறுல புள்ளி வறுங்கும் திட்டம் - பத்திரம் I

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

விதேத ஈடுதீதி }
விதேத அறிவுறுத்தல்

புது பிஶுரஶு }
஌ரு ஶரியான விடைக்கு

01

விதேத }
புள்ளி வீதம்

஌ப லுஷு 01 X 50 = 50

GCE AL Examination, August 2013 (AL/2013/20/E-II) – MCQ

(Model Answers)

Q No.	Answer	Q No.	Answer	Q No.	Answer	Q No.	Answer	Q No.	Answer
1.	4	11.	3	21.	4	31.	2	41.	5
2.	1	12.	2	22.	4	32.	5	42.	2
3.	1	13.	4	23.	3	33.	1	43.	3
4.	4	14.	4	24.	4	34.	3	44.	2
5.	4	15.	3	25.	2	35.	5	45.	3
6.	2	16.	4	26.	5	36.	1	46.	4
7.	1	17.	2	27.	5	37.	2	47.	3
8.	2	18.	1	28.	2	38.	1	48.	2
9.	3	19.	2	29.	5	39.	2	49.	1
10.	2	20.	3	30.	2	40.	4	50.	4

GCE AL Examination, August 2013 (AL/2013/20/E-II) – PART A

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
1		<pre> <head> <title>Test Cricket</title> </head> <body> <h1>Sri Lankan Test cricket records</h1> (or h2) <hr/> <p>The Sri Lankan national cricket team played their first Test match on 17 February 1982 against England. </p> <p>Record Groups</p> Team records Individual records Partnership records <h2>Partnership records</h2> (or h3) <p> Sri Lanka holds the most number of partnership records in Test cricket, with the records for the second, third, fourth, and sixth wickets. South Africa and Pakistan are ranked second with two records each. </p> <table border = "1"> <caption>Highest wicket partnerships</caption> <tr> <th>Runs</th> <th>Wicket</th> <th colspan = "2">Partners</th> </tr> <tr> <td>335</td> <td>1st wicket</td> <td>Marvan Atapattu</td> <td>Sanath Jayasuriya</td> </tr> </pre>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	10

(Model Answers)

		<pre> <tr> <td>576</td> <td>2nd wicket</td> <td>Sanath Jayasuriya</td> <td>Roshan Mahanama</td> </tr> </table> </body> </html> </pre> <p>Notes: <hr/> or <hr> is considered as correct answer. or is considered as correct answer.</p>		
2	(a)	<p>Address space = 2^{32} Maximum usable size of memory = 2^{32} bytes $= 2^2 \times 2^{30}$ bytes = $2^2 / 2^{20}$ GB $= 4$ GB</p> <p><i>only one unit consider bytes / GB (at least one unit GB/byte)</i></p>	1 1 1	3
	(b)	<p>Process is a program in execution - <i>කටයුතු වන ප්‍රොග්‍රෑමක් ක්‍රියාත්මක වන විට</i> Program can have multiple processes</p>	1 1	2
	(c)	<p><i>Virtual memory</i> To <u>suspend a process temporary to the hard disk</u> in order to <u>free the memory</u> (memory full), <u>to place another process in the main memory</u>.</p> <p>Note: 1. suspend a process 2. temporary 3. hard disk <i>or virtual memory</i> 4. free the memory (memory full) 5. to place another process in the main memory.</p>	1 1 1 1 1	5

(Model Answers)

Q No	Section	Model Answer	Marks				
			Break down	Total			
3	(a) i	$13_{10} - 00001101$ $-19_{10} - 11101101$ <i>Consider 8 bits</i>	1 2	3			
	(a) ii	$13_{10} - 19_{10} =$ <table style="margin-left: 100px; border-collapse: collapse;"> <tr><td style="border-bottom: 1px solid black;">00001101</td></tr> <tr><td style="border-bottom: 1px solid black;">11101101</td></tr> <tr><td>11111010</td></tr> </table>	00001101	11101101	11111010	1	1
00001101							
11101101							
11111010							
	(a) iii	<p>Identify the sign of the final decimal number by most significant bit (both positive and negative) <i>and</i> Most significant digit is 0 → positive convert to decimal</p> <p>Most significant digit is 1 → negative Take the sign as negative Get binary number Invert bit values Add 1 to least significant bit Convert the number to decimal</p> <p>Or</p> <p>Apply the reverse process of two's complement (<u>explanation</u>) Convert the number to decimal</p>	1 1	2			
	(b)	Examples having following features B2B: Purchase & sale between 2 companies through Internet Mutual agreement Consumers are not involved B2C: Products and services sold through Internet Business to consumers Consumer to consumed (Amazon.com) C2C: Sale of goods across Internet Consumer to consumer C2B: Consumer acts as the seller and business as the buyer through Internet Internet Consumer is made payment for the service provided	1 each	4			

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
4	(a)	<p>Primary key of a table and foreign key of another table establish the relationship in a database.</p> <p>Note:</p> <p>1. When only the foreign key definition is given: 1 mark only</p> <p>2. Given the relationship: 2 marks</p> <p>Notes for teachers:</p> <p><u>Primary Key</u>: Identify each record in a database table uniquely. (This removes data duplication.)</p> <p><u>Foreign key</u>: Foreign key of a table is a primary key of another table.</p>	2	2
	(b)	<p>1. student(studentId, name)</p> <p>2. sport(sportId, name)</p> <p>3. studentSport(studentId, sportId, year, capacity)</p> <p>Note:</p> <p>1. Three tables to represent student, sport and participate: 1 mark</p> <p>2. Relating participate relation with other two tables: 1 mark</p> <p>3. Proper attributes in each table: with primary key identified 1 mark</p> <p><i>Not consider</i></p>		3
	(c) i	<p>Select distinct sportId from studentSport where capacity <> "captain"</p> <p>Note:</p> <p>Reduce 1 mark if distinct is not specified.</p> <p><i>where NOT(capacity = 'captain')</i></p> <p><i>(or * or name with join)</i> <i>select distinct name from studentSport, sport where capacity <> 'captain' and studentSport.sportId = sport.sportId</i></p>	3	3 3/2/0
	(c) ii	<p>Select student.studentId, student.name from student, studentSport Where student.studentId = studentSport.studentId and studentSport.capacity = "captain"</p>	2	2

(c) i - Select distinct name from studentSport A, Sport B where capacity <> 'captain' AND NOT (capacity = 'captain')

- join - A.sportId = B.sportId
order by name

Not consider

(Model Answers)

Q No	Section	Model Answer	Marks																																									
			Break down	Total																																								
1	(a) i	<p>Smoke detector: S1 Flame detector: S2 Heat detector: S3 Output: Q</p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>S2</td> <td>S3</td> <td>Q</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Note: 8 correct rows: 4 marks 7 or 6 correct rows: 3 marks 5 or 4 correct rows: 2 marks 3 or 2 correct rows: 1 mark</p> <p>$F = \bar{A}BC + A\bar{B}C + AB\bar{C} + ABC$ $F = AB + BC + CA$</p>	A	B	C	F	S1	S2	S3	Q	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	4	4
A	B	C	F																																									
S1	S2	S3	Q																																									
0	0	0	0																																									
0	0	1	0																																									
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1	0	0	0																																									
1	0	1	1																																									
1	1	0	1																																									
1	1	1	1																																									
	(a) ii	<p>$Q = S1'.S2.S3 + S1.S2'.S3 + S1.S2.S3' + S1.S2.S3$ $Q = S1.S2 + S2.S3 + S3.S1 \leftarrow (K-map)$</p>	1	1																																								
	(b) i	<p>$Q = A.B.C. + A'.B.C + A.B.C'$ =working = B.(A + C)</p> <p>} K-map for 2 marks Uses P for 2 marks</p> <p>Mention of at least two algebraic rules</p> <p>Note: If the simplification is stopped one step above or gone one more step further, only 3 marks out of 4</p>	1 4 2	7																																								

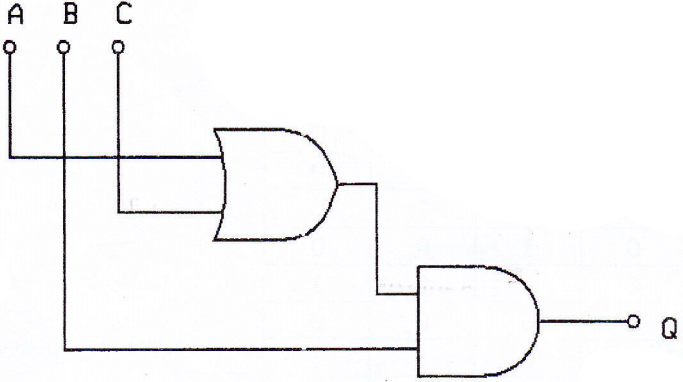
$$\begin{aligned}
 Q &= (A + \bar{A})BC + A\bar{B}C \\
 &= 1 \cdot BC + A\bar{B}C \\
 &= B(C + A\bar{C}) \\
 &= B \cdot (C + A) \cdot (C + \bar{C}) \\
 &= B \cdot (C + A) \cdot 1 \\
 &= B(A + C)
 \end{aligned}$$

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$$\begin{aligned}
 Q &= ABC + \bar{A}BC + A\bar{B}C \\
 &= ABC + \bar{A}BC + A\bar{B}C + ABC \\
 &= B[C(A + \bar{A}) + A \cdot (C + \bar{C})] \\
 &= B[(C \cdot 1) + (A \cdot 1)] \\
 &= B(A + C)
 \end{aligned}$$

Idempotent Law
 Distributive Law
 Inverse Element
 Identity Law

(Model Answers)

Q No	Section	Model Answer	Marks																													
			Break down	Total																												
1.	(b) ii	 <p>Note:</p> <ol style="list-style-type: none"> The 3 marks should be given only when the simplification has given at least 3 marks out of 4. The diagram is drawn to the final simplification expression. 	3 Or 0	3																												
2	(a) i	<table border="0"> <tr> <td></td> <td>ISDN</td> <td>ADSL</td> <td></td> </tr> <tr> <td>Speed:</td> <td>Upload and download are same</td> <td>faster download speeds than upload speeds.</td> <td>1 <i>(Contrast)</i></td> </tr> <tr> <td>Connectivity:</td> <td>end-to-end</td> <td>point-to-point</td> <td></td> </tr> <tr> <td></td> <td>Multiple access:</td> <td>Single access</td> <td></td> </tr> <tr> <td></td> <td>Synchronous</td> <td>Asynchronous</td> <td></td> </tr> <tr> <td></td> <td>Low speed data</td> <td>High speed data</td> <td></td> </tr> <tr> <td>Signal type:</td> <td colspan="2">Both provide digital communication (data and voice)</td> <td>1 <i>(Similarity)</i></td> </tr> </table> <p>Notes for teachers:</p> <p>ISDN - Integrated Services Digital Network: provides end-to-end (circuit switched) connectivity through a 64 kbps digital circuit.</p> <p>ADSL – Asymmetric digital subscriber line: provides faster data transmission over copper telephone lines. The technology provides faster download speeds than upload speeds.</p>		ISDN	ADSL		Speed:	Upload and download are same	faster download speeds than upload speeds.	1 <i>(Contrast)</i>	Connectivity:	end-to-end	point-to-point			Multiple access:	Single access			Synchronous	Asynchronous			Low speed data	High speed data		Signal type:	Both provide digital communication (data and voice)		1 <i>(Similarity)</i>		2
	ISDN	ADSL																														
Speed:	Upload and download are same	faster download speeds than upload speeds.	1 <i>(Contrast)</i>																													
Connectivity:	end-to-end	point-to-point																														
	Multiple access:	Single access																														
	Synchronous	Asynchronous																														
	Low speed data	High speed data																														
Signal type:	Both provide digital communication (data and voice)		1 <i>(Similarity)</i>																													

(Model Answers)

Q No	Section	Model Answer	Marks																									
			Break down	Total																								
2	(a) ii	<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Channels:</td> <td style="width: 35%;">CDMA Single</td> <td style="width: 35%;">GSM Multiple</td> </tr> <tr> <td>Data transmission rate</td> <td>Fast</td> <td>Slow</td> </tr> <tr> <td>Security of data</td> <td>More</td> <td>Less</td> </tr> <tr> <td>Encoding</td> <td>Digital</td> <td>Digital</td> </tr> <tr> <td>Signal</td> <td>Radio/Wireless</td> <td>Radio/wireless</td> </tr> <tr> <td></td> <td>3G</td> <td>3G</td> </tr> <tr> <td></td> <td colspan="2">Voice and data both</td> </tr> <tr> <td>Medium of transmission</td> <td colspan="2">Both wireless</td> </tr> </table> <p>Notes for teachers: CDMA - Code division multiple access: allows several transmitters to send information simultaneously over a single communication channel. Each transmitter is assigned a code to allow multiple users to be multiplexed over the same physical channel.</p> <p>GSM - Global System for Mobile Communications: is an open, digital cellular technology used for transmitting mobile voice and data services. In this technology, mobile phones make the connections by searching for cells in the immediate vicinity.</p>	Channels:	CDMA Single	GSM Multiple	Data transmission rate	Fast	Slow	Security of data	More	Less	Encoding	Digital	Digital	Signal	Radio/Wireless	Radio/wireless		3G	3G		Voice and data both		Medium of transmission	Both wireless		1	2
Channels:	CDMA Single	GSM Multiple																										
Data transmission rate	Fast	Slow																										
Security of data	More	Less																										
Encoding	Digital	Digital																										
Signal	Radio/Wireless	Radio/wireless																										
	3G	3G																										
	Voice and data both																											
Medium of transmission	Both wireless																											
	(b) i	Web server – <u>serves web pages</u> stored in the server to client computers <i>handles/manages</i>	1	1																								
	(b) ii	Mail server – <u>provides email facilities</u> to client computers	1	1																								
	(b) iii	Proxy server – <u>allows a local network to access the Internet through a single public IP address</u> (sharing a single Internet connection)	1	1																								
	(b) iv	DHCP server – <u>assigns IP addresses dynamically</u> to computers connected to the network	1	1																								

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(c) i	<p>DHCP with at least one line - 1 mark</p> <p>Note: Without DHCP 1 mark to computers with switch - 1 mark</p>	2	2
	(c) ii	<p>Note: <u>Without internet 1 mark</u></p>	2	2

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(c) iii	<p>The diagram shows a network topology. At the top is an oval labeled 'Internet'. Below it is a 'switch' connected to the Internet. This switch is also connected to a 'Web server' and an 'Email server'. Below this switch is a 'proxy server'. Below the proxy server is another 'switch' which is connected to a 'DHCP server'. The bottom switch has several lines radiating from it, with the handwritten text '10 pc' below it. Red curly braces and numbers are used for marking: a brace around the top switch and proxy server is labeled '1'; a brace around the bottom switch and DHCP server is labeled '1'; and a brace around the entire network structure is labeled '1'. There is also a handwritten note 'All connected - 1' at the bottom right.</p> <p>Note: 1. Without proxy: no marks. 2. Proxy without two network connections: 2 marks only 3. Proxy server without two switches: 1 mark only (two network connections)</p>	3	3

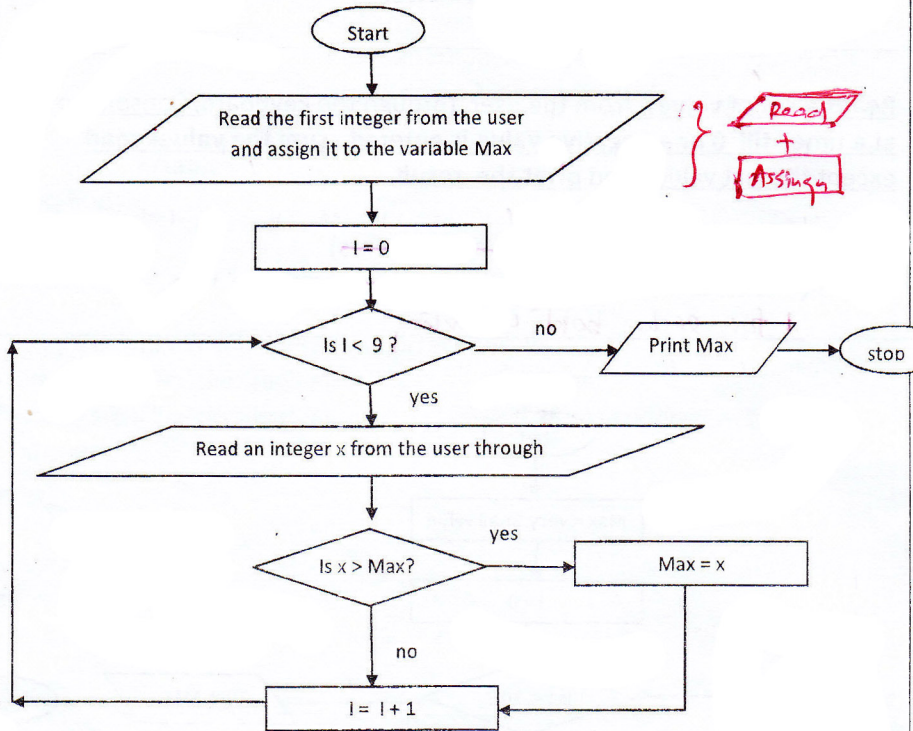
(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
3	(a)	1. Accuracy (data duplication) explanation 2. Efficiency explanation	1 1 1 1	4
	(b)	1. Privacy of patients Justification 2. Safety of patients Justification	1 1 1 1	4
	(c)	No. Discussion of 1. Saving of money 2. Increase of efficiency 3. Increase of transparencies in state sector	1 1 1 1	4
	(d)	Not a good decision Reasons (b) <i>Privacy & Safety</i>	1 1 (each)	3
4	(a)	a = 4 Acquires storage to store an integer value, assigns the label "a" and store (assign) the vale 4 at that location. b = 4.7 Acquires storage to store a floating point value, assigns the label "b" and store (assign) the vale 4.7 at that location. c = a + b <i>getting of a and b</i> Retrieves the value stored at the location (with the label) a, converts it to type float, retrieves the value stored at the location (with the label) b, add them together, Acquires storage to store a floating point value , assigns the label c, and stores (assigns) the result of the addition at that location.	1 1 2	4

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
4	(b)	<p><u>Reads a set of values</u> from the user <u>through the keyboard/Console</u>, <u>one at a time</u>, <u>till 0 or a negative value is entered</u>, <u>sum the values read except the last value</u>, and <u>print the result</u>.</p> <p>Notes: (1 Mark for all 4 essential components) (1 additional Mark for each other component) <i>1 for each bold underlined</i></p>	4	4
4	(c) i	<pre> graph TD Start([Start]) --> Init[Max = very small value] Init --> I0[I = 0] I0 --> Loop{Is I < 10?} Loop -- no --> Print[/Print Max/] Print --> Stop([stop]) Loop -- yes --> Read[/Read an integer x from the user through/] Read --> MaxCheck{Is x > Max?} MaxCheck -- yes --> MaxAssign[Max = x] MaxAssign --> IInc[I = I + 1] MaxCheck -- no --> IInc IInc --> Loop </pre> <p>Or</p>		4

(Model Answers)



Note:

- All correct: 4 marks
- Reading 10 numbers: 1 mark
- Logic to compute max: 1 mark
- Print: 1 mark
- Termination: 1 mark

Loop

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
4	(c) ii	<p>Essential parts are in bold typeface</p> <pre> max = - 1000 # max should be assigned a value smaller than any value expected . for i in range(0,10): # range(x,y) should generate any list of 10 items x = int(input(str(i+1) + " Enter a value : ")) if x > max: max = x print("Maximum value is : ",max) or max = -1000 i = 0 while i < 10: x = int(input()) if x > max: max = x i = i + 1 print (max) or maximum = int(input("Input a number: ")) for i in range(0, 9): maximum = max(input("Input a number: ", maximum) print("Maximum value is: ", maximum) Note: All correct: 3 marks Reading 10 numbers: 1 mark Logic to compute max: 1 mark Print: 1 mark </pre> <p><i>Case sensitive is not consider, but indentation is essential</i></p> <p><i>print(max) within while loop or outside loop consider</i></p>		3

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
5		<pre> erDiagram Company --o{ Register : "1" Register --o{ CarOwner : "n" CarOwner --o{ Car : "1" Car --o{ Rent : "n" Car --o{ Request : "m" Request --o{ Customer : "n" Customer --o{ name : "" Customer --o{ address : "" Customer --o{ contactTP : "" Customer --o{ custID : "" Car --o{ CarOwner : "n" Car --o{ Driver : "m" Driver --o{ Hire : "m" Driver --o{ Drives : "m" Driver --o{ driverID : "" </pre>		

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
		<p><u>Entities</u> 1. Car owner 2. Car 3. Driver 4. Customer 5. Company</p> <p><u>Relationship with degrees</u> Rent Request Drives Note: No marks for the other relationships with Company entity.</p> <p>Primary keys</p> <p>Attributes of customer</p> <p><i>x. Consider customer attributes</i> <i>x. Cardinality is not consider</i></p>	<p>1 each</p> <p>1 each</p> <p>1 each</p> <p>1 each</p>	<p>5</p> <p>3</p> <p>4</p> <p>3</p>
6	(a)	<p>1. System <u>shall</u> (should) be able to sort items 2. System <u>shall</u> (should) be able to put items into the correct delivery van 3. System <u>shall</u> (should) be able to read bar code</p> <p>Note: <u>1 mark for the function and 1 mark for the justification</u></p>	<p>2 each (2+2)</p>	4
	(b)	<p>1. Accuracy 2. Efficiency Justification</p> <p>Note: <u>Without justification 1 marks each.</u></p>	<p>2 2 2 each (2+2)</p>	8
	(c)	<p>Correct Reasons (answer (b))</p>	<p>1 1 each (1+1)</p>	3