

~~SL/12/09/10/102~~

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NEW
Kiran Jayathilaka
3032

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

NATIONAL EVALUATION & TESTING SERVICE
DEPARTMENT OF EXAMINATION - SRI LANKA



20 - Information & Communication Technology

Marking Scheme

This has been prepared for the use of marking examiners. Some changes would be made according to the views presented at the chief examiner's meeting. This could be used as a teaching aid in the classroom.

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அந்தரங்கமானது

ශ්‍රී ලංකා විශාල දෙපාර්තමේන්තුව

இலங்கைப் பர්ட්‍යාසத் திணைக்களம்

ජාතික ඇගයීම් හා පරීක්ෂණ සේවාව

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අ.පො.ස. (උ.පෙළ) විභාගය 2013

க.පො.ත.(ඉ.තර)ப் பர්ත්‍යාස 2013

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ලකුණු දීමේ පටිපාටිය - I පත්‍රය
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| පිළිබඳ ප්‍රාග්ධන අංකය
විනා ඩීල |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 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 | |

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එක පිළිබඳකට

ஒரு சரியான விடைக்கு

01

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ப්‍රාග්ධන ඩීල

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

(Model Answers)

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.	19	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> (or h3/h4) (Strong) 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"> or "2" <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>	1	10

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

(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:</p> <p><hr> or <hr> is considered as correct answer.</p> <p> or is considered as correct answer.</p>		
2	(a)	<p>Address space = 2^{32}</p> <p>Maximum usable size of memory = 2^{32} bytes $= 2^2 \times 2^{30}$ bytes $= 4 \text{ GB}$</p> <p>$2^{32}/2^{30} = 2^2 = 4 \text{ GB}$</p> <p><i>optional</i></p>	1	1
	(b)	<p>Process is a program in execution</p> <p>Program can have multiple processes</p>	1	2
	(c)	<p>To suspend a process temporary to the hard disk in order to free the memory (memory full), to place another process in the main memory.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. suspend a process 2. temporary 3. hard disk 4. free the memory (memory full) 5. to place another process in the main memory. 	1 1 1 1 1	5

memory full no swapped out

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

(Model Answers)

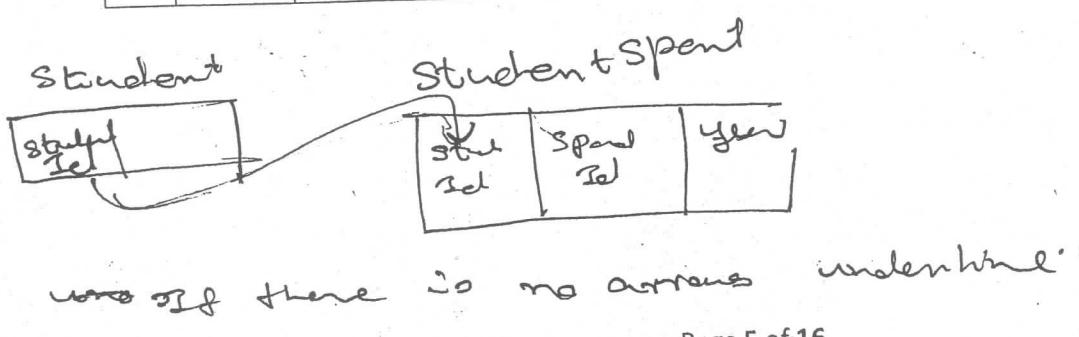
Q No	Section	Model Answer	Marks	
			Break down	Total
3	(a) i	$\begin{array}{r} 13_{10} - 00001101 \\ -19_{10} - 11101101 \end{array}$	1 2	3
	(a) ii	$13_{10} - 19_{10} = \begin{array}{r} 00001101 \\ \underline{11101101} \\ 11111010 \end{array}$	1	1
	(a) iii	<p style="text-align: center;"><i>negative or positive</i></p> <p>Identify the sign of the final decimal number by most significant bit (both positive and negative)</p> <p>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 Apply the reverse process of two's complement (explanation) Convert the number to decimal</p> <p style="text-align: right; margin-right: 100px;"><i>explain with the example</i></p>	1 1	2
	(b)	<p>Examples having following features</p> <p>B2B: Purchase & sale between 2 companies through Internet Mutual agreement Consumers are not involved</p> <p>B2C: Products and services sold through Internet Business to consumers <u>www.</u> Consumer to consumer <u>(Amazon.com)</u></p> <p>C2C: Sale of goods across Internet Consumer to consumer</p> <p>C2B: Consumer acts as the seller and business as the buyer through Internet</p> <p>Consumer is made payment for the service provided</p>	1 each	4

giving the first explanation. The second

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

(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> <ol style="list-style-type: none"> 1. When only the foreign key definition is given: 1 mark only 2. Given the relationship: 2 marks <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	
	(b)	<p>1. student(<u>studentId</u>, name) 2. sport(<u>sportId</u>, name) 3. studentSport(<u>studentId</u>, <u>sportId</u>, year, capacity)</p> <p><u>studentId</u>, <u>sportId</u>, <u>year</u>, <u>capacity</u></p> <p>Note:</p> <ol style="list-style-type: none"> 1. Three tables to represent student, sport and participate: 1 mark 2. Relating participate relation with other two tables: 1 mark 3. Proper attributes in each table: primary key <u>studentId</u> 1 mark 	3	
	(c) i	<p>or none or * *</p> <p>Select <u>distinct</u> sportId from studentSport where capacity <> "captain" <u>captain</u>" captain</p> <p><u>distinct</u></p> <p>Note: Reduce 1 mark if <u>distinct</u> is not specified.</p>	3	
	(c) ii	<p>Select student.studentId, student.name from student, studentSport Where student.studentId = studentSport.studentId and studentSport.capacity = "captain"</p>	2	



Costs minimize - Cost +

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

(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"> <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> </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>	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
S1	S2	S3	Q																																					
0	0	0	0																																					
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1	1	0	1																																					
1	1	1	1																																					
	(a) ii	$Q = S1' \cdot S2 \cdot S3 + S1 \cdot S2' \cdot S3 + S1 \cdot S2 \cdot S3' + S1 \cdot S2 \cdot S3$	1	1																																				
	(b) i	$ \begin{aligned} Q &= A \cdot B \cdot C + A' \cdot B \cdot C + A \cdot B \cdot C' \\ &= \dots \text{working} \\ &= B \cdot [A + C] \end{aligned} $ <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>	$B \cdot A \cdot (A + A') + A \cdot B \cdot C'$ $B \cdot C + A \cdot B \cdot C'$ $B \cdot C + A \cdot C \leftarrow \textcircled{3}$ $B \cdot C + A \cdot C \leftarrow \textcircled{3}$	1 4 2																																				

Select distinct name

from student - spent A, spent B

where capacity \leftrightarrow captain*, not capacity*capt

and student - spent student-id

Page 6 of 16

= spent · spent Id
 $\frac{B}{B}$

Order by name (optional)

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

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
1.	(b) ii	<p>Note: 1. The 3 marks should be given only when the simplification has given at least 3 marks out of 4. 2. The diagram is drawn to the final simplification expression.</p>	3 Or 0	3
2	(a) i	<p>ISDN</p> <p>Speed: Upload and download are same</p> <p>Connectivity: end-to-end</p> <p>Multiple access</p> <p>Synchronous</p> <p>Low speed data</p> <p>Signal type: Both provide digital communication (data and voice)</p> <p>Notes for teachers: ISDN - Integrated Services Digital Network: provides end-to-end (circuit switched) connectivity through a 64 kbps digital circuit. ADSL – Asymmetric digital subscriber line: provides faster data transmission over copper telephone lines. The technology provides faster download speeds than upload speeds.</p>	<p>ADSL</p> <p>faster download speeds than upload speeds.</p> <p>point-to-point</p> <p>Single access</p> <p>Asynchronous</p> <p>High speed data</p> <p>expensive</p> <p>1</p>	2

= /
 X
 neteqn

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

(Model Answers)

Q No	Section	Model Answer	Marks																																									
			Break down	Total																																								
2	(a) ii	<table> <tbody> <tr> <td>Channels:</td> <td>CDMA Single</td> <td>GSM Multiple</td> <td>1</td> <td>2</td> </tr> <tr> <td>Data transmission rate</td> <td>Fast</td> <td>Slow</td> <td></td> <td></td> </tr> <tr> <td>Security of data</td> <td>More</td> <td>Less</td> <td></td> <td></td> </tr> <tr> <td>Encoding</td> <td>Digital</td> <td>Digital</td> <td>1</td> <td>18</td> </tr> <tr> <td>Signal</td> <td>Radio/Wireless</td> <td>Radio/wireless</td> <td></td> <td></td> </tr> <tr> <td></td> <td>3G</td> <td>3G</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Voice and data both</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Medium of transmission</td> <td>Both wireless</td> <td></td> <td></td> <td></td> </tr> </tbody> </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. <i>Adushanka(B.Sc)</i> 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	1	2	Data transmission rate	Fast	Slow			Security of data	More	Less			Encoding	Digital	Digital	1	18	Signal	Radio/Wireless	Radio/wireless				3G	3G				Voice and data both				Medium of transmission	Both wireless					
Channels:	CDMA Single	GSM Multiple	1	2																																								
Data transmission rate	Fast	Slow																																										
Security of data	More	Less																																										
Encoding	Digital	Digital	1	18																																								
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	1	1																																								
	(b) ii	Mail server – <u>provides email facilities</u> to client computers <i>handle emails</i>	1	1																																								
	(b) iii	Proxy server – allows a local network to access the Internet through a <u>single public IP address</u> (<u>sharing a single Internet connection</u>) <i>* Sharing important</i>	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>Without DHCP 1 mark 1 or computers with switch</p>	2	2
	(c) ii	<p>Without internet 1 mark</p>	2	2

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(c) iii	<pre> graph TD Internet([Internet]) --- Switch1[switch] Switch1 --- WebServer[Web server] Switch1 --- EmailServer[Email server] Switch1 --- ProxyServer[proxy server] ProxyServer --- Switch2[switch] Switch2 --- DHCPServer[DHCP server] </pre> <p>Note:</p> <ol style="list-style-type: none"> Without proxy: (network 2/6) no marks. Proxy without two network connections: 2 marks only Proxy server without two switches: 1 mark only (two network connections) <p>proxy over switch no ①</p>	3	3

System \rightarrow environment

env \rightarrow sys to system

Security
System
Env safe by

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

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
3	(a)	<p>1. Accuracy (data duplication) explanation</p> <p>2. Efficiency explanation</p>	1 1 1 1	4
	(b)	<p>1. Privacy of patients Justification</p> <p>2. Safety of patients Justification</p>	1 1 1 1	4
	(c)	<p>No.</p> <p>Discussion of</p> <p>1. Saving of money — <i>s/o cost is high</i> } 2. Increase of efficiency 3. Increase of transparencies in state sector</p> <p><i>and all must be</i></p>	1 1 1 1	4
	(d)	<p>Not a good decision</p> <p>Reasons (b)</p>	1 1 <i>fereable</i>	3
4	(a)	<p>a = 4 Acquires storage to store an integer value, assigns the label "a" and store (assign) the value 4 at that location.</p> <p>b = 4.7 Acquires storage to store a floating point value, assigns the label "b" and store (assign) the value 4.7 at that location.</p> <p>c = a + b <i>get</i> / <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.</i></p> <p><i>no hold</i></p>	1 1 2 or 3	4

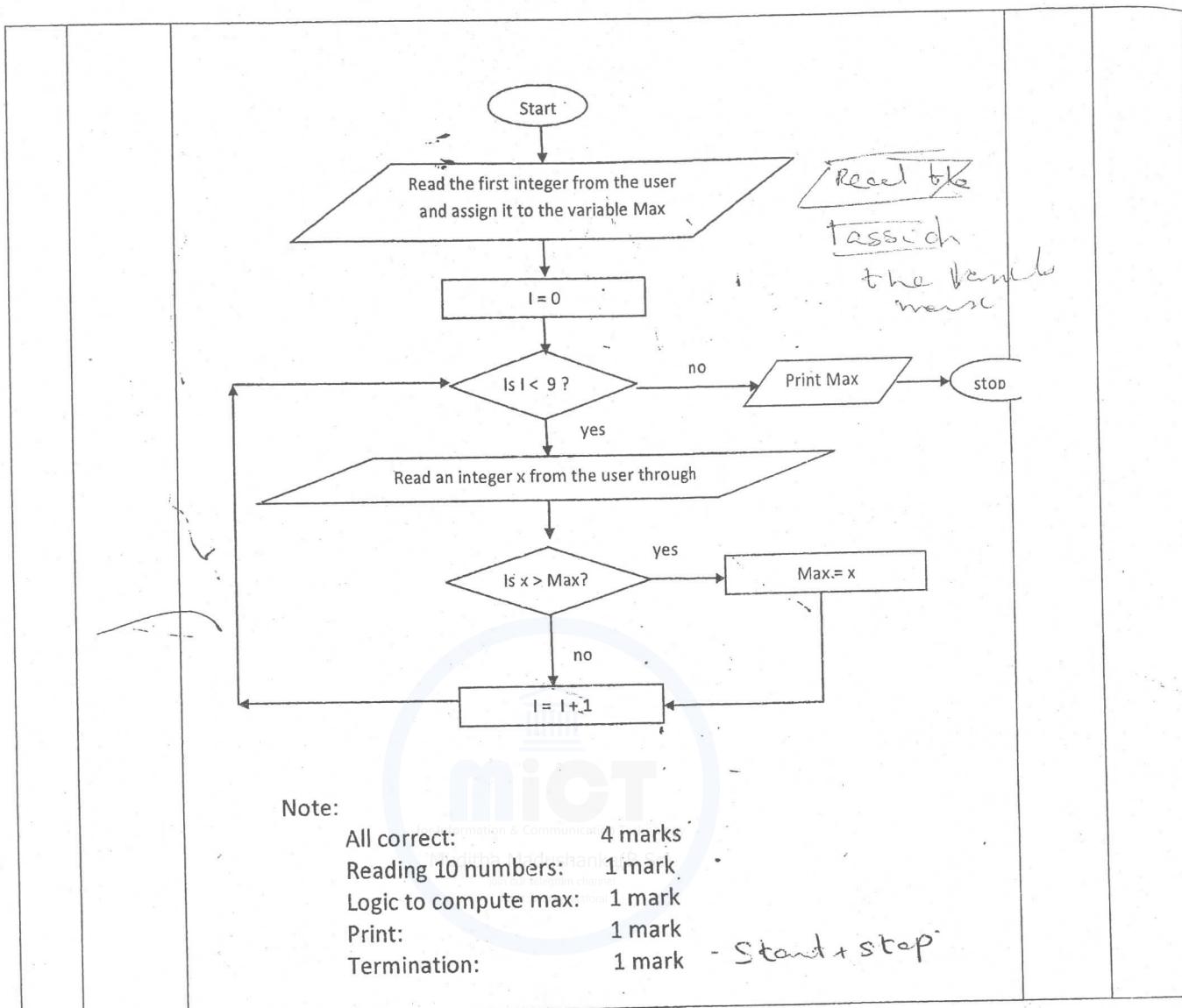
Retrieve the value stored at a and b

memory don't yet process

(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, one at a time, till 0 or a negative value is entered, sum the values read except the last value, and print the result.</u></p> <p>Notes: (1 Marks for all 4 essential components) <u>bold and underline</u> (1 additional Mark for each other component)</p> <p><i>bold underline ness no marks</i></p>	4	4
4	(c) i	<pre> graph TD Start((Start)) --> Max[Max = very small value] Max --> I0[I = 0] I0 --> Cond{Is I < 10?} Cond -- yes --> Read[/Read an integer x from the user through/] Read --> Cond Cond -- no --> Print[Print Max] Print --> Stop((Stop)) Read --> CompX{Is x > Max?} CompX -- yes --> MaxX[Max = x] MaxX --> Cond CompX -- no --> Iplus1[I = I + 1] Iplus1 --> Cond </pre> <p>The flowchart starts with an oval labeled "Start". It then goes to a rectangle "Max = very small value". Next is a rectangle "I = 0". Then a decision diamond "Is I < 10?". If "yes", it goes to a parallelogram "Read an integer x from the user through". From "Read", it goes back to the decision diamond "Is I < 10?". If "no", it goes to a parallelogram "Print Max", then to an oval "stop". From "Read", it also goes to a decision diamond "Is x > Max?". If "yes", it goes to a rectangle "Max = x", then back to the decision diamond "Is I < 10?". If "no", it goes to a rectangle "I = I + 1", then back to the decision diamond "Is I < 10?".</p> <p>Or</p>	4	

(Model Answers)



if max > 0 — logic X

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

(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)</pre> <p>or</p> <pre>max = -1000 i = 0 while i < 10: x = int(input()) if x > max: max = x i = i + 1 print (max)</pre> <p>or</p> <pre>maximum = int(input("Input a number: ")) for i in range(0, 9): maximum = max(input("Input a number: ", maximum)) print("Maximum value is: ", maximum)</pre> <p>Note:</p> <table> <tr> <td>All correct:</td> <td>3 marks</td> </tr> <tr> <td>Reading 10 numbers:</td> <td>1 mark</td> </tr> <tr> <td>Logic to compute max:</td> <td>1 mark</td> </tr> <tr> <td>Print:</td> <td>1 mark</td> </tr> </table>	All correct:	3 marks	Reading 10 numbers:	1 mark	Logic to compute max:	1 mark	Print:	1 mark		3
All correct:	3 marks											
Reading 10 numbers:	1 mark											
Logic to compute max:	1 mark											
Print:	1 mark											

' case sensitive -

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
5		<pre> erDiagram company --o{ carOwner : "Register" company --o{ driver : "Hire" carOwner --o{ car : "Rent" driver --o{ car : "Drives" customer } --o{ car : "Request" customer { o string name o string address o string contactTP } } </pre>		

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

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
		<p><u>Entities</u></p> <p>1. Car owner 2. Car 3. Driver 4. Customer 5. Company</p> <p><u>Relationship with degrees</u></p> <p>Rent Request Drives</p> <p>Note: No marks for the other relationships with Company entity.</p> <p>Primary keys</p> <p>Attributes of customer</p> <p><i>Cardinality by — optional</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><i>should</i> <i>Sort</i> <i>Delivery</i> <i>Barcode</i></p> <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: 1 mark for the function and 1 mark for the justification</p>	<p>2 each</p>	4
	(b)	<p>1. Accuracy 2. Efficiency</p> <p>Justification <i>Ans</i></p> <p>Note: Without justification 1 marks each.</p>	<p>2</p> <p>2</p> <p>2 each</p>	8
	(c)	<p>Correct Reasons (answer (b))</p>	<p>1</p> <p>1 each</p>	3