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

NATIONAL EVALUATION & TESTING SERVICE
DEPARTMENT OF EXAMINATION - SRI LANKA

20 - Information & Communication Technology

Marking Scheme


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<td>...</td>
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</table>

"01" ஆசிரியர்  

命题 01 x 50 = 50

AL. Suman's Control markin
<table>
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<tr>
<th>Q No.</th>
<th>Answer</th>
<th>Q No.</th>
<th>Answer</th>
<th>Q No.</th>
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<th>Q No.</th>
<th>Answer</th>
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<th>Answer</th>
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<td>14.</td>
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<td>24.</td>
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<td>26.</td>
<td>5</td>
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<td>46.</td>
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<td>37.</td>
<td>2</td>
<td>47.</td>
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<td>2</td>
<td>18.</td>
<td>1</td>
<td>28.</td>
<td>2</td>
<td>38.</td>
<td>1</td>
<td>48.</td>
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<td>19.</td>
<td>2</td>
<td>29.</td>
<td>5</td>
<td>39.</td>
<td>2</td>
<td>49.</td>
<td>1</td>
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<td>2</td>
<td>20.</td>
<td>3</td>
<td>30.</td>
<td>2</td>
<td>40.</td>
<td>4</td>
<td>50.</td>
<td>4</td>
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</tbody>
</table>
<h1>Sri Lankan Test cricket records</h1> (or h2)
<p>The Sri Lankan national cricket team played their first Test match on 17 February 1982 against England.</p>
<ul>
  <li>Team records</li>
  <li>Individual records</li>
  <li>Partnership records</li>
</ul>

<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>Partners</th>  
  </tr>  
  <tr>    <td>335</td>    <td>1st wicket</td>    <td>Marvan Atapattu</td>  
  </tr>  
  <tr>    <td>2</td>    <td>2nd wicket</td>    <td>Sanath Jayasuriya</td>  
  </tr>  
</table>
### Model Answers

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Address space = $2^{32}$&lt;br&gt;Maximum usable size of memory = $2^{32}/2$ bytes&lt;br&gt;$= 2^3 \times 2^{30}$ bytes&lt;br&gt;$= 4 \text{ GB}$</td>
<td>3</td>
</tr>
<tr>
<td>(b)</td>
<td>Process is a program in execution&lt;br&gt;Program can have multiple processes</td>
<td>2</td>
</tr>
<tr>
<td>(c)</td>
<td>To suspend a process temporarily to the hard disk in order to free the memory (memory full), to place another process in the main memory.</td>
<td>5</td>
</tr>
</tbody>
</table>

Note:
1. suspend a process<br>2. temporary<br>3. hard disk<br>4. free the memory (memory full)<br>5. to place another process in the main memory.
<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(a) i</td>
<td>$00001101 - 11101101$</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(a) ii</td>
<td>$00001101 = 11101101$</td>
<td>1</td>
</tr>
</tbody>
</table>
|      | (a) iii | Identify the sign of the final decimal number by most significant bit (both positive and negative)  
Most significant digit is 0 $\rightarrow$ positive  
convert to decimal  
Most significant digit is 1 $\rightarrow$ negative  
Take the sign as negative  
Get binary number  
Invert bit values  
Add 1 to least significant bit  
Convert the number to decimal  
Or  
Apply the reverse process of two's complement (explanation)  
Convert the number to decimal | 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 consumer  
Amazon.com  
C2C: Sale of goods across Internet  
Consumer to consumer  
C2B: Consumer acts as the seller and business as the buyer through Internet  
Consumer is made payment for the service provided | 4     |

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

#### (Model Answers)

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>(a)</td>
<td>Primary key of a <strong>table</strong> and foreign key of another <strong>table</strong> establish the relationship in a database.</td>
<td>2</td>
</tr>
</tbody>
</table>

**Note:**
1. When only the foreign key definition is given: 1 mark only
2. Given the relationship: 2 marks

**Notes for teachers:**
- **Primary Key:** Identify each record in a database table uniquely. (This removes data duplication.)
- **Foreign key:** Foreign key of a table is a primary key of another table.

| (b) | 1. student(studentId, name)  
2. sport(sportId, name)  
3. studentSport(studentId, sportId, year, capacity) |
|-----|-------------------------------------------------
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
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|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  

**Note:**
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: 1 mark

| (c) i | Select distinct sportId from studentSport  
where capacity <> 'captain'  
and captain  
|------|-------------------------------------------------
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
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|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  

**Note:**
Reduce 1 mark if distinct is not specified.

| (c) ii | Select student.studentId, student.name from student, studentSport  
Where student.studentId = studentSport.studentId and  
studentSport.capacity = 'captain'  
|------|-------------------------------------------------
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  
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|     | ![Diagram](female.png)  
|     | ![Diagram](female.png)  

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### Model Answers

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
</tr>
</thead>
</table>
| 1    | (a) i   | Smoke detector: S1  
Flame detector: S2  
Heat detector: S3  
Output: Q |

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Q</th>
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<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>1</td>
<td>0</td>
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<td>1</td>
<td>0</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a) ii</td>
<td>Q = S1'.S2.S3 + S1'.S2'.S3 + S1.S2.S3' + S1.S2.S3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
</tr>
</thead>
</table>
| 1    | (b) i   | Q = A.B.C + A'.B.C + A.B.C'  
= ... working  
= B.[A + C]  
\( p \cdot (A + A') + A \cdot B \cdot C' \)  
\( B \cdot C + A \cdot B \cdot C' \)  
\( (C + A \cdot C') \)  
\( p \cdot C \cdot C' \cdot A' \) |

Note:  
Mention of at least two algebraic rules

If the simplification is stopped one step above or gone one more step further, only 3 marks out of 4

Select distinct name
from student sport A, sport B
where capacity <= captain
and student sport student id
= sport sport id
order by name (optional)
GCE AL Examination, August 2013 (AL/2013/20/E-II) – PART B

(Model Answers)

<table>
<thead>
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<th>Section</th>
<th>Model Answer</th>
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<tbody>
<tr>
<td>1.</td>
<td>(b) ii</td>
<td>![Logic Diagram]</td>
<td>3</td>
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</table>

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.

<table>
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<th>Section</th>
<th>Model Answer</th>
<th>Marks</th>
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<tbody>
<tr>
<td>2</td>
<td>(a) i</td>
<td>ISDN: Upload and download are same speed. ADSL: faster download speeds than upload speeds. Connectivity: end-to-end access vs point-to-point access. Synchronous vs Asynchronous access. Low speed data vs High speed data. Signal type: Both provide digital communication (data and voice).</td>
<td>2</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
<th>Marks</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>(a) ii</td>
<td>Channels: CDMA Single, GSM Multiple</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data transmission rate: Fast, Slow</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Security of data: More, Less</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Encoding: Digital, Digital</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal: Radio/Wireless, Radio/wireless</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium of transmission: Both wireless</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notes for teachers: CDMA - <em>Code division multiple access</em>: 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. GSM - <em>Global System for Mobile Communications</em>: 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.</td>
<td>1</td>
</tr>
<tr>
<td>(b) i</td>
<td></td>
<td>Web server - serves web pages stored in the server to client computers</td>
<td>1</td>
</tr>
<tr>
<td>(b) ii</td>
<td></td>
<td>Mail server - provides email facilities to client computers</td>
<td>1</td>
</tr>
<tr>
<td>(b) iii</td>
<td></td>
<td>Proxy server - allows a local network to access the Internet through a single public IP address (sharing a single Internet connection)</td>
<td>1</td>
</tr>
<tr>
<td>(b) iv</td>
<td></td>
<td>DHCP server - assigns IP addresses dynamically to computers connected to the network</td>
<td>1</td>
</tr>
</tbody>
</table>
(Model Answers)

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>(c) i</td>
<td>switch</td>
<td>2</td>
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<td></td>
<td></td>
<td>DHCP server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without DHCP 1 mark</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>at least</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 mark</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(c) ii</td>
<td>Internet</td>
<td>2</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Web server</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Email server</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without internet 1 mark</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note:
1. Without proxy: (network **not** set) no marks.
2. Proxy without two network connections: 2 marks only
3. Proxy server without two switches: (two network connections) 1 mark only

Internet

Web server

switch

Email server

proxy server

switch

DHCP server

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### GCE A\(\text{L}\) Examination, August 2013 (AL/2013/20/E-II) – PART B

#### (Model Answers)

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
<th>Breakdown</th>
<th>Total</th>
</tr>
</thead>
</table>
| 3    | (a)     | 1. Accuracy (data duplication) explanation  
       |         | 2. Efficiency explanation | 1  | 1  |
|      |         |             |           | 4    |
|      | (b)     | 1. Privacy of patients  
       |         | Justification  
       |         | 2. Safety of patients  
       |         | Justification | 1  | 1  |
|      |         |             |           | 4    |
|      | (c)     | No.  
       |         | Discussion of  
       |         | 1. Saving of money – s\(\text{he cost as high}\) and all must be | 1  | 1  |
|      |         |             |           | 4    |
|      | (d)     | Not a good decision  
       |         | Reasons (b) | 1  | 1  |
|      |         |             |           | 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. | 1  | 1  |
|      |         | 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. | 1  | 1  |
|      |         | c = a + b  
       |         | 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. | 2  | 0  |

**Page 11 of 16**
(Model Answers)

**Question 4 (b)**

Reads a set of values from the user 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.

Notes: (1 Mark for all 4 essential components) for bold and underline (1 additional Mark for each other component)

**Question 4 (c) i**

Start

Max = very small value

i = 0

Is i < 10?

no

Print Max

stoo

yes

Read an integer x from the user through

Is x > Max?

yes

Max = x

no

i = i + 1

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

(Model Answers)

Start

Read the first integer from the user and assign it to the variable Max

l = 0

Is l < 9 ?

no

Print Max

Stop

yes

Read an integer x from the user through

Is x > Max?

no

1 = 1 + 1

yes

Max = x

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

if max > 0 log x
## (Model Answers)

<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
</tr>
</thead>
</table>
| 4    | (c) ii  | Essential parts are in bold typeface  
\[
\text{max = -1000} \quad \# \quad \text{max should be assigned a value smaller than any value expected.}
\]
\[
\text{for i in range(0,10):} \quad \# \quad \text{range(x,y) should generate any list of 10 items}
\]
\[
x = \text{int(input(str(i+1) + " Enter a value : ")})
\]
\[
\text{if x > max:}
\]
\[
\quad \text{max = x}
\]
\[
\text{print("Maximum value is : ",max)}
\]
\[
\text{or}
\]
\[
\text{max = -1000}
\]
\[
i = 0
\]
\[
\text{while i < 10:}
\]
\[
\quad x = \text{int(input())}
\]
\[
\quad \text{if x > max:}
\]
\[
\quad \quad \text{max = x}
\]
\[
\quad i = i + 1
\]
\[
\text{print (max)}
\]
\[
\text{or}
\]
\[
\text{maximum = int(input("Input a number: "))}
\]
\[
\text{for i in range(0, 9):}
\]
\[
\quad \text{maximum = max(input("Input a number: ", maximum)}
\]
\[
\text{print("Maximum value is: ", maximum)}
\]

### Note:
- All correct: 3 marks
- Reading 10 numbers: 1 mark
- Logic to compute max: 1 mark
- Print: 1 mark

---

`case sensitive`
<table>
<thead>
<tr>
<th>Q No</th>
<th>Section</th>
<th>Model Answer</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Entities</td>
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<tr>
<td></td>
<td></td>
<td>1. Car owner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Car</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Driver</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Customer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Company</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Relationship with degrees</strong></td>
</tr>
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<td></td>
<td></td>
<td>Rent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Request</td>
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<tr>
<td></td>
<td></td>
<td>Drives</td>
</tr>
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<td></td>
<td>Note: No marks for the other relationships with Company entity.</td>
</tr>
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<td>Attributes of customer</td>
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<td><strong>Cardinality by</strong></td>
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<td><strong>Primary key</strong></td>
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</tr>
<tr>
<td></td>
<td></td>
<td><strong>Primary key</strong></td>
</tr>
</tbody>
</table>

6 (a)

1. System shall (should) be able to sort items
2. System shall (should) be able to put items into the correct delivery van
3. System shall (should) be able to read bar code

Note: 1 mark for the function and 1 mark for the justification

6 (b)

1. Accuracy
2. Efficiency

Justification

Note: Without justification 1 marks each.

6 (c)

Correct
Reasons (answer (b))

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<tr>
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</tr>
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</tr>
<tr>
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<tr>
<td>3</td>
</tr>
<tr>
<td>1 each</td>
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<tr>
<td>2 each</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1 each</td>
</tr>
</tbody>
</table>