

Code No - 3437

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.

077
89369

ரஹஸ்யம்

அந்தரங்கமானது

தீர்மான வினா தேர்வுகளைக் குறித்து

இலங்கைப் பரீட்சைத் திணைக்களம்

சாதிக்க அறிவு மற்றும் பரீட்சைத் திணைக்களம்

தேசிய மதிப்பீட்டிற்கும் பரீட்சைத் திணைக்களம் சேவை

அ.பொ.க. (உ.பொ.) வினா 2013

க.பொ.த.(உ.தர)ப் பரீட்சை 2013

வினா

பாடம்

ICT

வினா அளவு

பாட இலக்கம் 20

தேர்வுத் திணைக்களம் - I பகுதி புள்ளி வழங்கும் திட்டம் - பத்திரம் I

பிரச்சனை அளவு	வினா விடை	பிரச்சனை அளவு	வினா விடை	பிரச்சனை அளவு	வினா விடை	பிரச்சனை அளவு	வினா விடை	பிரச்சனை அளவு	வினா 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

வினா அளவு

வினா அறிவுறுத்தல்

பிரச்சனை

ஒரு சரியான விடைக்கு

01

வினா

புள்ளி வீதம்

மொத்தம் 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

(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/> <hr/> ✓ <p>The Sri Lankan national cricket team played their first Test match on 17 February 1982 against England. </p> or (strong) ✓ <p>Record Groups</p> (or h3/h4) 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>	<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

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}</p> <p>Maximum usable size of memory = 2^{32} bytes = $2^2 \times 2^{30}$ bytes = 4 GB → not necessary (GB)</p> <p>OR $\frac{2^{32}}{2^{30}} = 2^2 = 4$</p>	1 1 1	3
	(b)	<p>Process is a program in execution ⁽ⁱ⁾</p> <p>Program can have multiple processes ⁽ⁱⁱ⁾</p>	1 1	2
	(c)	<p>To suspend a process temporary to the <u>hard disk</u> in order to <u>free the memory</u> (memory full), to <u>place another process in the main memory</u>.</p> <p>Note: 1. suspend a process 2. temporary 3. hard disk (virtual memory) 4. free the memory (memory full) 5. to place another process in the main memory.</p> <p>virtual memory consist of hard disk and main memory.</p>	1 1 1 1 1	5

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	$\begin{array}{r} 13_{10} - 19_{10} = \\ 00001101 \\ \underline{11101101} \\ 11111010 \end{array}$	1	1
	(a) iii	<p>Identify the sign of the final decimal number by most significant bit (both positive and negative)</p> <p><i>or sign bit</i></p> <p>(Most significant digit is 0 → positive convert to decimal } <i>write the process (1)</i></p> <p>Most significant digit is 1 → negative } <i>(1)</i></p> <p>Take the sign as negative Get binary number Invert bit values Add 1 to least significant bit Convert the number to decimal } <i>(1)</i></p> <p>Or</p> <p>Apply the reverse process of two's complement (explanation) } <i>(1)</i></p> <p>Convert the number to decimal</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 Consumer to consumed (Amazon.com) → <i>even products and services</i></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 <u>Consumer is made payment for the service provided</u></p>	1 each	4

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> <p>1. When only the foreign key definition is given: 1 mark only 2. Given the relationship: 2 marks.</p> <p>Notes for teachers: <u>Primary Key</u>: Identify each record in a database table uniquely. (This removes data duplication.) <u>Foreign key</u>: Foreign key of a table is a primary key of another table.</p>	2	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>Note:</p> <p>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: with <u>underline</u> the <u>primary key</u>. 1 mark</p>	3	3
	(c) i	<p>Select (<u>distinct</u>) sportId from studentSport where capacity <> "captain"</p> <p>Note: Reduce 1 mark if distinct is not specified.</p>	3	3
	(c) ii	<p>Select student.studentId, student.name from student, studentSport Where student.studentId = studentSport.studentId and studentSport.capacity = "captain"</p>	2	2

Handwritten notes and diagrams:

Diagram: A table with columns 'Sport ID' and 'name'. Below it, 'student sports' is written, with a table structure: (studentId, sportId, year, capacity). A note says 'so also correct'.

SQL Query: `select distinct (sportId) from studentSport where capacity <> 'captain'`

SQL Query: `select distinct B.name from studentSport, sport where studentSport.studentId = sport.sportId and studentSport.capacity = 'captain'`

Page 5 of 16

(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																																					
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																																					
	(a) ii	$Q = S1'.S2.S3 + S1.S2'.S3 + S1.S2.S3' + S1.S2.S3$	1	1																																				
	(b) i	<p>$Q = A.B.C. + A'.B.C + A.B.C'$ — (1 mark) =working = B.[A + C]</p> <p>Mention of at least two algebraic rules (2 marks)</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																																				

Selected distinct A, B, Name from Student Sport A, Sport B where capacity < > 'captain'

$ABC + \bar{A}BC + A\bar{B}C$ associative
 $BC(A + \bar{A}) + A\bar{B}C$ (distributive law)
 $BC(1) + A\bar{B}C$ (Idempotent law)

$BC + A\bar{B}C$

$BC(C + A\bar{B})$ — boundary

$B(C + A)$

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

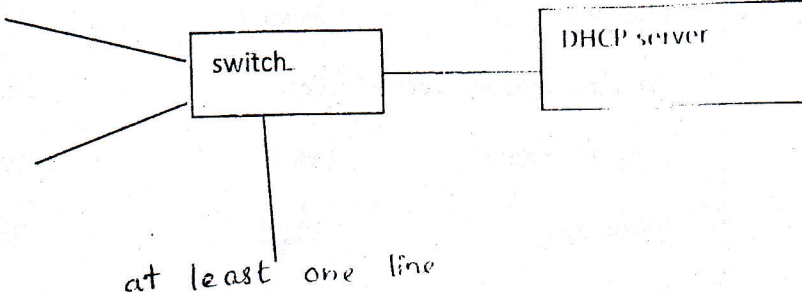
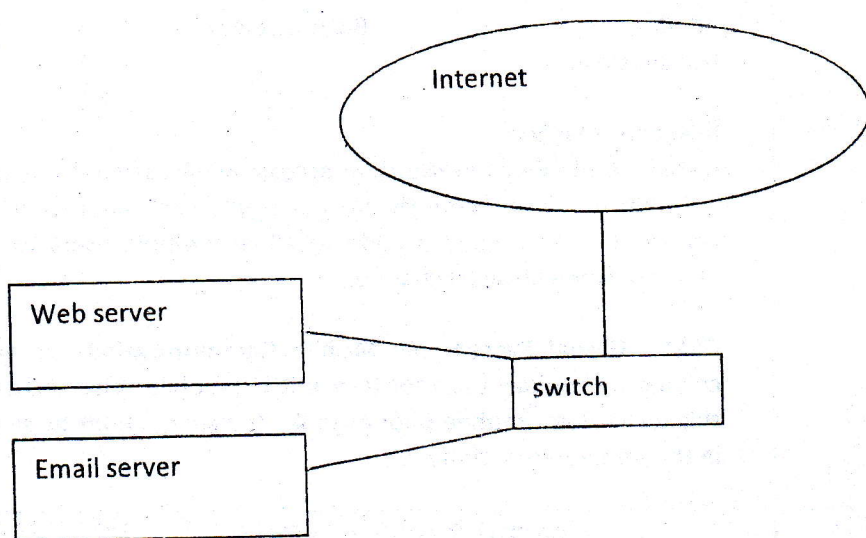
(Model Answers)

Q No	Section	Model Answer	Marks																					
			Break down	Total																				
1.	(b) ii	<div data-bbox="435 548 1145 907" data-label="Diagram"> </div> <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>Speed:</td> <td>ISDN Upload and download are same</td> <td>ADSL faster download speeds than upload speeds.</td> <td rowspan="5">} 1 mark</td> </tr> <tr> <td>Connectivity:</td> <td>end-to-end</td> <td>point-to-point</td> </tr> <tr> <td></td> <td>Multiple access</td> <td>Single access</td> </tr> <tr> <td></td> <td>Synchronous</td> <td>Asynchronous</td> </tr> <tr> <td></td> <td>Low speed data</td> <td>High speed data</td> </tr> <tr> <td>Signal type:</td> <td colspan="2">Both provide digital communication (data and voice)</td> <td>→ 1</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>	Speed:	ISDN Upload and download are same	ADSL faster download speeds than upload speeds.	} 1 mark	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		2
Speed:	ISDN Upload and download are same	ADSL faster download speeds than upload speeds.	} 1 mark																					
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																					

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(a) ii	<p>Channels: CDMA Single GSM Multiple</p> <p>Data transmission rate Fast Slow</p> <p>Security of data More Less</p> <p>Encoding Digital Digital</p> <p>Signal Radio/Wireless Radio/wireless</p> <p>3G 3G</p> <p>Voice and data both</p> <p>Medium of transmission Both wireless</p> <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. 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>	1	2
	(b) i	<p><i>(gives) / handle, manages also correct</i></p> <p>Web server – <u>serves web pages</u> stored in the server to client computers</p>	1	1
	(b) ii	<p><i>handle, (manage), maintain, handle, manage</i></p> <p>Mail server – provides email facilities to client computers</p>	1	1
	(b) iii	<p>Proxy server – allows a local network to access the Internet through a single public IP address (sharing a single Internet connection)</p>	1	1
	(b) iv	<p>DHCP server – <u>assigns IP addresses dynamically</u> to computers connected to the network</p>	1	1

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(c) i	 <p>at least one line</p> <p>* Note: \rightarrow (with 10 computers) Without DHCP 1 mark with DHCP \uparrow with at least one line 1 mark</p>	2	2
	(c) ii	 <p>Note: Without internet 1 mark</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 box labeled 'switch'. To the left of this switch are two boxes: 'Web server' and 'Email server', both connected to the switch. Below the first switch is a box labeled 'proxy server', connected to it. Below the proxy server is another box labeled 'switch', connected to it. To the right of this second switch is a box labeled 'DHCP server', connected to it. Handwritten annotations include '1 mark' next to the 'Email server' and '1 mark' next to the 'proxy server'.</p>	3	3
		<p>Note:</p> <ul style="list-style-type: none"> 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><i>switch + proxy + two servers ✓ 1 mark.</i></p>		

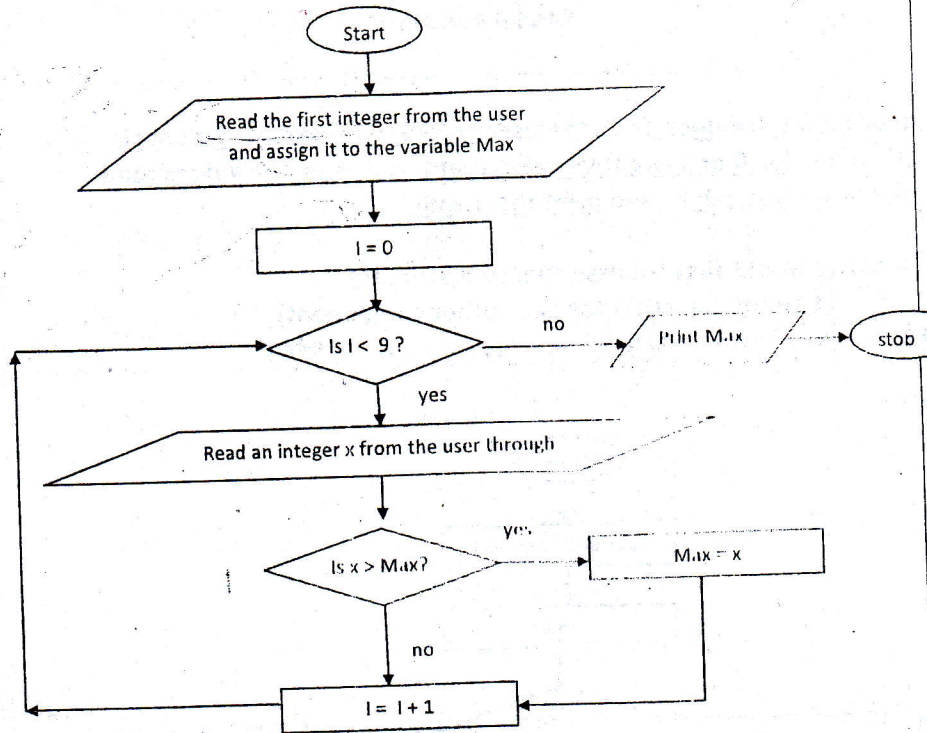
(Model Answers)

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)	2 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. 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>get the value a and b from the mem's memory</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>Reads a set of values from the user through the keyboard/Console, one at a time, <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><i>(1 mark for each bold and underline)</i></p> <p>Notes: (1 Marks for all 4 essential components) (1 additional Mark for each other component) <i>if consider explain step by step.</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 --> Compare{Is x > Max?} Compare -- yes --> Update[Max = x] Compare -- no --> Inc[i = i + 1] Update --> Inc Inc --> 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

04

(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> <p>All correct: 3 marks Reading 10 numbers: 1 mark Logic to compute max: 1 mark Print: 1 mark </p>		3

no consider case sensitive
indentation essential

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
5		<pre> erDiagram Company --o{ Car Owner : Register Company --o{ Driver : Hire Car Owner --o{ Car : Rent Car --o{ Customer : Request Car --o{ Driver : Drives Driver --o{ Car : Drives Company { string OwnerID PK } Car Owner { string OwnerID PK } Car { string CarID PK } Customer { string name string address string custID PK string contactTP } Driver { string driverID PK } </pre>		

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
		<p><u>Entities</u></p> <ol style="list-style-type: none"> 1. Car owner 2. Car 3. Driver 4. Customer 5. Company <p><u>Relationship with degrees</u></p> <p>Rent <i>owner - car (1:M)</i></p> <p>Request <i>customer - car (1:M)</i></p> <p>Drives <i>car - driver (1:M)</i></p> <p>Note: No marks for the other relationships with Company entity.</p> <p>Primary keys</p> <p>Attributes of customer</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</p> <p>2. System <u>shall</u> (should) be able to put items into the correct delivery van</p> <p>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>	<p>4</p>
4	(b)	<p>1. Accuracy <i>→ →</i></p> <p>2. Efficiency <i>→ →</i></p> <p>Justification <i>to spend three days</i></p> <p>Note: Without justification 1 marks each.</p>	<p>2</p> <p>2</p> <p>2 each</p>	<p>8</p>
2	(c)	<p>Correct Reasons (answer (b)) <i>Accuracy - 1 mark</i> <i>Efficiency - 1 mark</i></p>	<p>1 each</p>	<p>3</p>