

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

அந்தரங்கமானது

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව

இலங்கைப் பரீட்சைத் திணைக்களம்

ජාතික ඇගයීම් හා පරීක්ෂණ සේවාව

தேசிய மதிப்பீட்டிற்கும் பரீட்சித்தலுக்குமான சேவை

අ.පො.ස. (උපෙළ) විභාගය 2013

க.பொ.த.(உ.தர)ப் பரீட்சை 2013

வினாக்கள்

பாடம் } ICT	வினாக்கள் அளவு பாட இலக்கம் } 20
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கொஞ்சு நீலே பவிசுவிய - I பருசு
புள்ளி வழங்கும் திட்டம் - பத்திரம் I

පිළිතුර අංකය	ප්‍රශ්න අංකය	පිළිතුර අංකය	ප්‍රශ්න අංකය	පිළිතුර අංකය	ප්‍රශ්න අංකය	පිළිතුර අංකය	ප්‍රශ්න අංකය	පිළිතුර අංකය	ප්‍රශ්න අංකය
විනෝද	විනෝද	විනෝද	විනෝද	විනෝද	විනෝද	විනෝද	විනෝද	විනෝද	විනෝද
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					

வினேஷ் சபேஷ்
விசேட அறிவுறுத்தல்

එක් පිළිතුරකට
ஒரு சரியான விடைக்கு

01

உதின்
புள்ளி வீதம்

මුළු ලකුණු 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	(a) i	Smoke detector: S1 Flame detector: S2 Heat detector: S3 Output: Q <table><tr><th>A</th><th>B</th><th>C</th><th>F</th></tr><tr><th>S1</th><th>S2</th><th>S3</th><th>Q</th></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> 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 $F = \bar{A}BC + A\bar{B}C + AB\bar{C} + ABC$ $F = AB + BC + CA$	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																																									
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1	0	1	1																																									
1	1	0	1																																									
1	1	1	1																																									
	(a) ii	$Q = S1'.S2.S3 + S1.S2'.S3 + S1.S2.S3' + S1.S2.S3$ $Q = S1.S2 + S2.S3 + S3.S1 \leftarrow (K-map)$	1	1																																								
	(b) i	$Q = A.B.C. + A'.B.C + A.B.C'$ =working = B.[A + C] Mention of at least two algebraic rules Note: If the simplification is stopped one step above or gone one more step further, only 3 marks out of 4	1 4 2	7																																								

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

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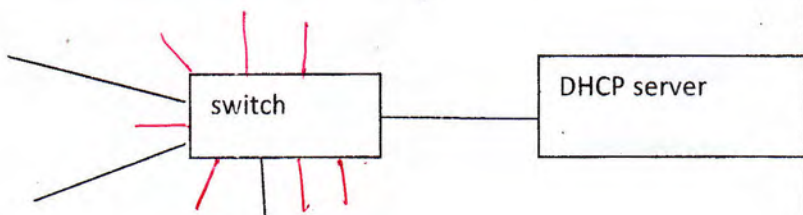
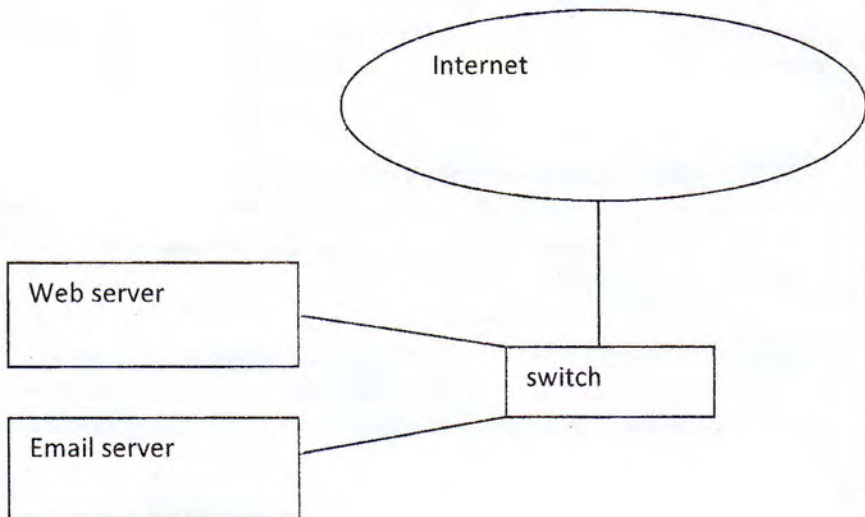
$$\begin{aligned}
 Q &= ABC + \bar{A}BC + AB\bar{C} \\
 &= ABC + \bar{A}BC + AB\bar{C} + ABC \\
 &= B[C(A + \bar{A}) + A(C + \bar{C})] \\
 &= B[(C \cdot 1) + (A \cdot 1)] \\
 &= B(A + C)
 \end{aligned}$$

Idempotent Law
 Distributive Law
 Inverse Element
 Identity Law

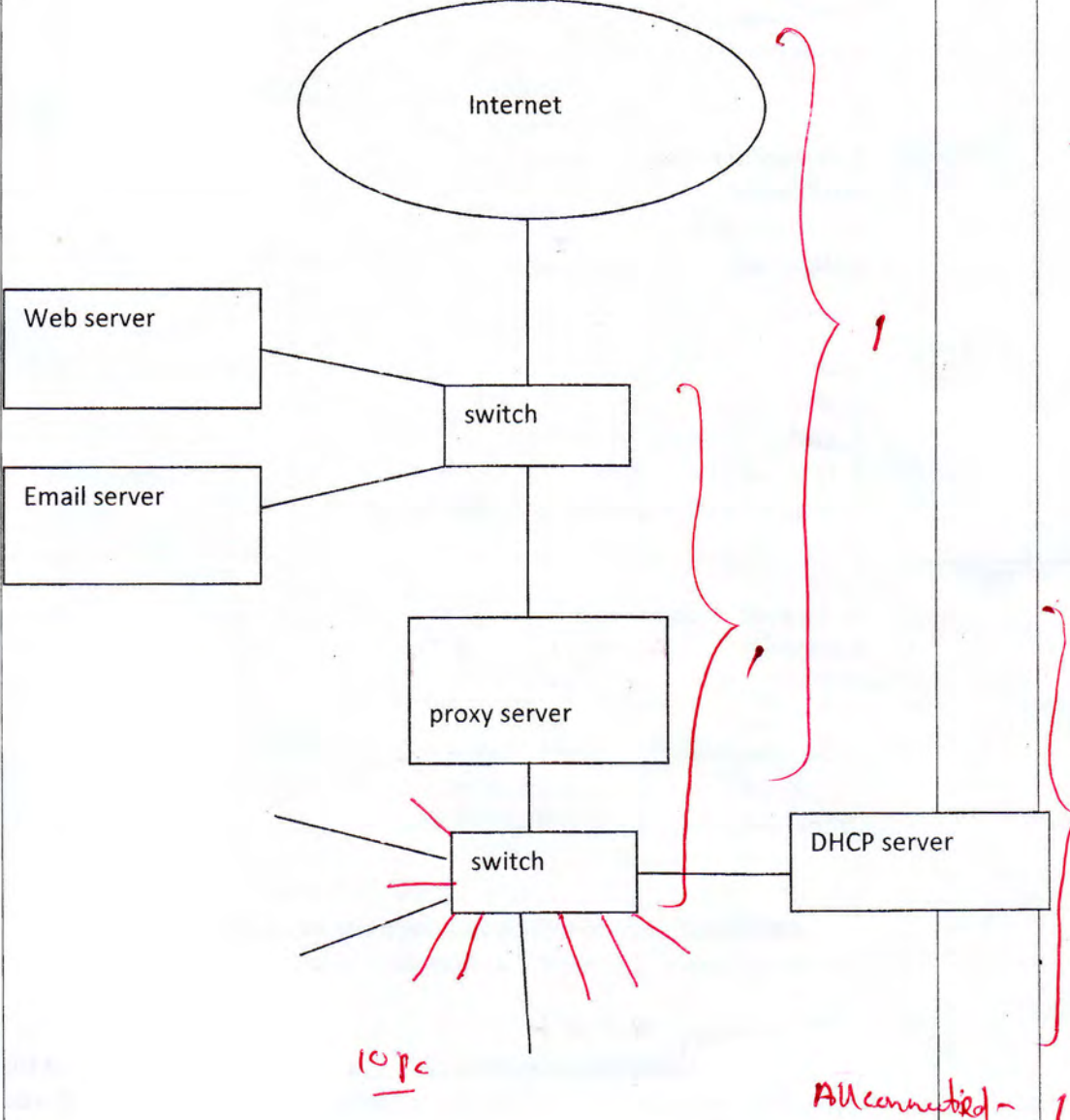
Page 7 of 16

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(a) ii	CDMA Single Channels: 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 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.	1	2
	(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	 <u>DHCP with at least one line</u> – 1 mark Note: Without DHCP <u>1 mark</u> <u>to computers with switch</u> – 1 mark	2	2
	(c) ii	 Note: <u>Without internet 1 mark</u>	2	2

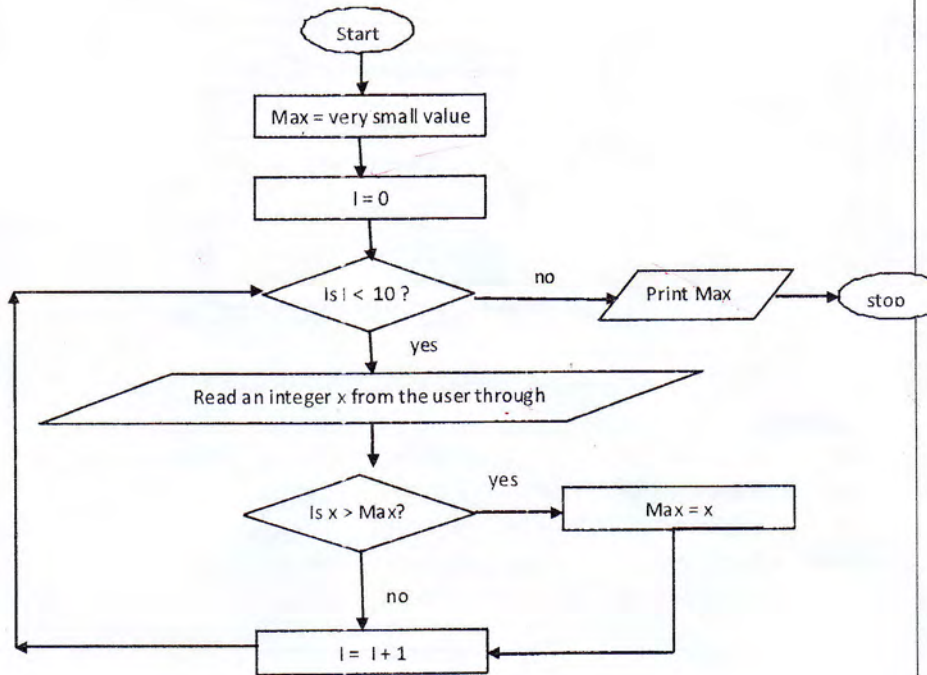
(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
2	(c) iii	 Internet Web server Email server switch proxy server switch DHCP server 10 pc 1 1 1 All connected - 1 Note: 1. Without proxy: 2. Proxy without two network connections: 3. Proxy server without two switches: (two network connections)	3	3

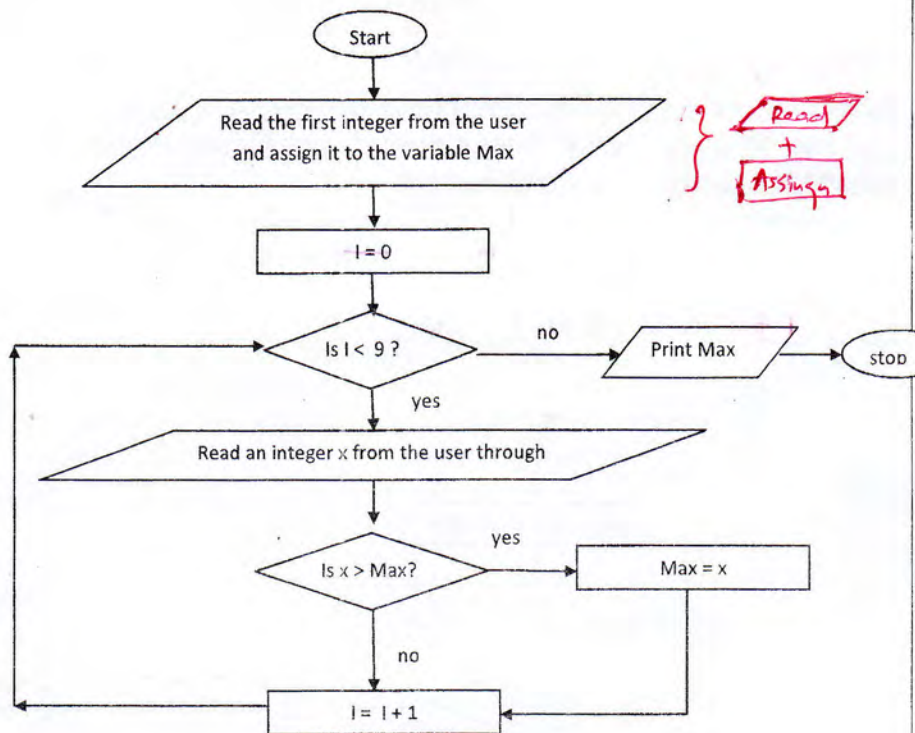
(Model Answers)

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>	<i>1</i> <i>1</i> <i>(each)</i>	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)	<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>. Notes: (1 Mark for all 4 essential components) (1 additional Mark for each other component) <i>1 for each bold underlined</i>	4	4
4	(c) i	 <pre> graph TD Start([Start]) --> Init[Max = very small value] Init --> I0[I = 0] I0 --> Cond1{Is I < 10?} Cond1 -- no --> PrintMax[/Print Max/] PrintMax --> Stop([stop]) Cond1 -- yes --> Read[/Read an integer x from the user through/] Read --> Cond2{Is x > Max?} Cond2 -- yes --> UpdateMax[Max = x] Cond2 -- no --> IncI[I = I + 1] UpdateMax --> IncI IncI --> Cond1 </pre> Or		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	Essential parts are in bold typeface 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		3

Case sensitive is not consider, but indentation is essential

print(max) within while loop or outside loop consider

(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 Car --o{ Customer : Request Car --o{ Driver : Drives Company { string OwnerID PK } CarOwner { string OwnerID PK } Car { string carID PK } Driver { string driverID PK } Customer { string custID PK string name string address string contactTP } </pre>		

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
		<u>Entities</u> 1. Car owner 2. Car 3. Driver 4. Customer 5. Company <u>Relationship with degrees</u> Rent Request Drives Note: No marks for the other relationships with Company entity. Primary keys Attributes of customer <i>x. Consider customer attributes</i> <i>x. Cardinality is not Consider</i>	1 each 1 each 1 each 1 each	5 3 4 3
6	(a)	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 Note: <u>1 mark for the function and 1 mark for the justification</u>	2 each (2+2)	4
	(b)	1. Accuracy 2. Efficiency Justification Note: <u>Without justification 1 marks each.</u>	2 2 2 each (2+2)	8
	(c)	Correct Reasons (answer (b))	1 1 each (1+1)	3

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>	1 1 1 1 1 1 1 1 1 1 1	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> Notes: <hr/> or <hr> is considered as correct answer. or is considered as correct answer.		
2	(a)	Address space = 2^{32} Maximum usable size of memory = 2^{32} bytes = $2^2 \times 2^{30}$ bytes = 4 GB $= 2^{32} / 2^{20}$ GB $= 4$ GB <i>only one unit consider bytes / GB (at least one unit GB/byte)</i>	1 1 1	3
	(b)	Process is a program in execution - <i>operation in programme that process that</i> Program can have multiple processes	1 1	2
	(c)	<i>Virtual memory</i> To <u>suspend a process temporary</u> to the <u>hard disk</u> in order to <u>free the memory</u> (memory full), <u>to place another process in the main memory</u>. 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.	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	$13_{10} - 19_{10} =$ $\begin{array}{r} 00001101 \\ 11101101 \\ \hline 11111010 \end{array}$	1	1
	(a) iii	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 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 Or Apply the reverse process of two's complement (<u>explanation</u>) Convert the number to decimal	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 Consumer is made payment for the service provided	1 each	4

(Model Answers)

Q No	Section	Model Answer	Marks	
			Break down	Total
4	(a)	Primary key of a table and foreign key of another table establish the relationship in a database. Note: 1. When only the foreign key definition is given: 1 mark only 2. Given the relationship: 2 marks 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.	2	2
	(b)	1. student(studentId, name) 2. sport(sportId, name) 3. studentSport(studentId, sportId, year, capacity) 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: with primary key identified 1 mark <i>Not consider</i>		3
	(c) i	Select distinct sportId from studentSport where capacity <> "captain" Note: Reduce 1 mark if distinct is not specified. <i>Or * or name with join)</i> <i>select distinct name from studentSport, Sport where capacity <> 'captain' and studentSport.sportId = Sport.sportId</i>	3	3 3/2/0
	(c) ii	Select student.studentId, student.name from student, studentSport Where student.studentId = studentSport.studentId and studentSport.capacity = "captain"	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