

**-Information and Communication Technology
First Term Test
Grade 13
Marking Scheme**

Paper I

Question	Answer	Question	Answer	Question	Answer	Question	Answer	Question	Answer
1	4	11	1	21	2	31	2	41	3
2	4	12	4	22	3	32	3	42	1
3	3	13	3	23	4	33	3	43	3
4	3	14	3	24	3	34	1	44	4
5	4	15	4	25	2	35	5	45	3
6	2	16	3	26	5	36	4	46	3
7	4	17	5	27	5	37	2	47	2
8	4	18	4	28	4	38	3	48	2
9	3	19	4	29	3	39	2	49	5
10	4	20	3	30	3	40	1	50	3

Paper II – part A

Question	Answers	Marks
1) i)	72 → 01001000	1
ii)	68 → 01000100 -68 → 10111011	2
iii)	$ \begin{array}{r} 01001000 \\ + 10111011 \\ \hline 10000011 \end{array} $	2
iv)	A → i = 1 B → i ≤ 5 C → tot = tot + x (consider the value of 'i' written by the student, give marks for the correct answers)	1 2 2

2) a. i)	A - Ready B - Blocked C - Terminated D - Swapped out and blocked	0.5*4=2
ii)	i. Long term scheduler ii. Short term scheduler iii. Mid term scheduler	1*3=3
b) i.	$2^8 = 256$ pages	1
ii.	Total memory capacity = 2^{32} Byte = 2^2 GB = 4 GB	2
iii.	Using nearby memory spaces in main memory, an user or a system program able to control whole program.	2
3) a)	i. - 0 Normalization /ONF Having functional dependencies ii. – Third Normalization /3NF Having transitive dependencies iii. - Third Normalization /1NF Having partial dependencies	1 x 3 = 3
b)	Item (Item No, Item Name, Item Price) Bill Item (Bill No, Item No, Quantity, Discount)	2 x 2 = 4
c)	SELECT Bill No, Date, Time, Cus Id from Bill;	For correct command-2 marks For correct whole answer- 1 mark
4) i)	Symmetric encryption Asymmetric encryption	2
ii)	The code which has written as unreadable are translated into readable again	1
iii)	Private Key , Public Key decryption	2
iv)	i.Functional ii. Non-Functional iii.Functional iv. Non-Functional v.Non-Functional	1*5=5

Part B

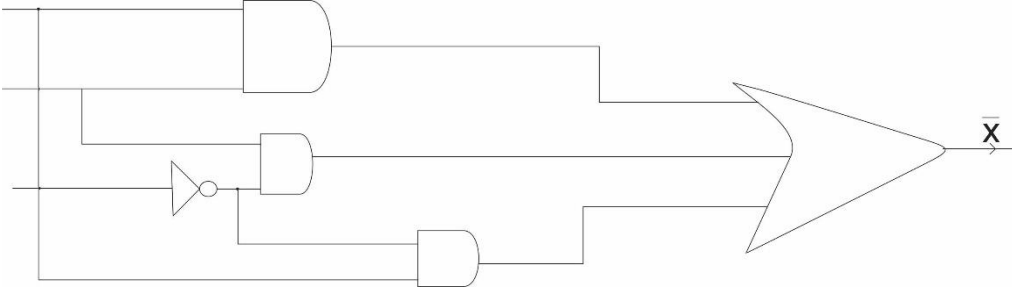
<p>1. a) (i.)</p>	<ul style="list-style-type: none"> • At the instance when information created • Freshness of the Information • Reliability of the Information <p>Give marks for any correct two answers</p>	<p>0.5*2=1</p>
<p>(ii)</p>	<p>Traditional communication methods</p> <ul style="list-style-type: none"> * Magazines, Newspapers, Articles, Books etc. * Posters * Loud speakers <p>Modern communication methods</p> <ul style="list-style-type: none"> * Sending SMS * Via e-mail * Fax * Internet 	<p>0.5*4=2</p>
<p>(iii)</p>	<p>(i.) Bank account number – Presence checking</p> <p>ii.) Start date – Type checking</p> <p>(iii.) Subject marks – Range checking</p> <p>(iv.) Number of balls of an over – Range checking</p>	<p>0.5*4=2</p>
<p>b</p>	<p>(i.) In the Registers (ii.) Cache memory</p> <p>(iii.) Main memory (iv.) ROM</p>	<p>1*4=4</p>
<p>C (i.)</p>	<p>42078</p> <p>1000 1000 0111</p> <p>8 8 7</p> <p>887₁₆</p> <p>Important – when offering final mark, mentioning the base of the value is compulsory. If not part marks for steps are given only.</p>	<p>For steps- 01 mark</p> <p>For final answer- 01 mark</p> <p>Total marks 1 +1 =2)</p>
<p>(ii)</p>	<p>01). 1275.0 LSD = 5 MSD = 1</p> <p>02). 0.05279 LSD = 9 MSD = 3</p>	<p>0.5*4=2</p>

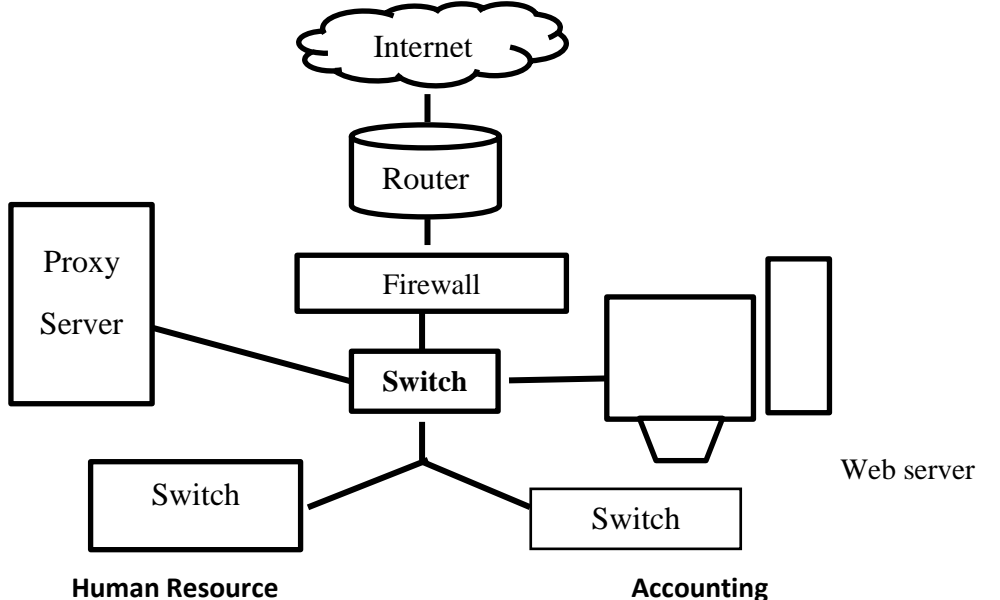
(iii.)	8+(-3)				
	Binary value of 8 in 8bits	=	00001000	0.5	
	Binary value of 3	=	00000011		
	One's compliment	=	11111100		
	Two's compliment	=	1		
			11111101	0.5	
	then 8+(-3)	=	00001000=+3	+11111101 =-3	0.5
			<u>00000101 = 5</u>	0.5	
				Total marks 02	

2 (i.)		A	B	C	X	
		0	0	0	0	
		0	0	1	0	
		0	1	0	1	
		0	1	1	0	
		1	0	0	1	
		1	0	1	0	
		1	1	0	1	
		1	1	1	1	
						For correct 8 lines -04 marks
						For correct 7 or 6 lines -03 marks
						For correct 5 or 4 lines -04 marks
						For correct 3 or less than -01 mark
						Total marks 4

ii)	$X = \bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + AB\bar{C} + ABC$	01 mark
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iii)		00	01	11	01	
	0	0	1	1	1	
	1	0	0	1	0	
						Marking correct data on map-01
						For correct 3 loops-03 simplified answer-01

		Total marks 5
(iv.)	$\begin{aligned} \bar{X} &= \bar{A}B\bar{C} + \overline{ABC} + AB\bar{C} + ABC \\ &= AB(C + \bar{C}) + \bar{A}B\bar{C} + \overline{ABC} \\ &\quad \text{(because } C + \bar{C}) \\ &= AB + \bar{A}B\bar{C} + \overline{ABC} \\ &= A[B + \overline{B\bar{C}}] + \overline{ABC} \\ &\quad \text{(because } B + \overline{B\bar{C}} = B + \bar{C}) \\ &= A(B + \bar{C}) + \bar{A}B\bar{C} \\ &= AB + A\bar{C} + \bar{A}B\bar{C} \\ &= \bar{C}(A + B) + AB \\ &\quad \text{(because } a + \bar{a}b = a + b) \\ &= \bar{C}(A + B +) + AB \\ &\quad B\bar{C} \end{aligned}$ <p style="text-align: right;">$X = AB + B\bar{C}$</p> <p>this X is similar to the answer which calculate using karnaugh map</p>	01 mark 01 mark 01 mark Total marks-3
(v.)	$X = AB + B\bar{C} + A\bar{C}$ 	For correct symbols - 01 mark For marking final output X - 01 mark total marks - 02

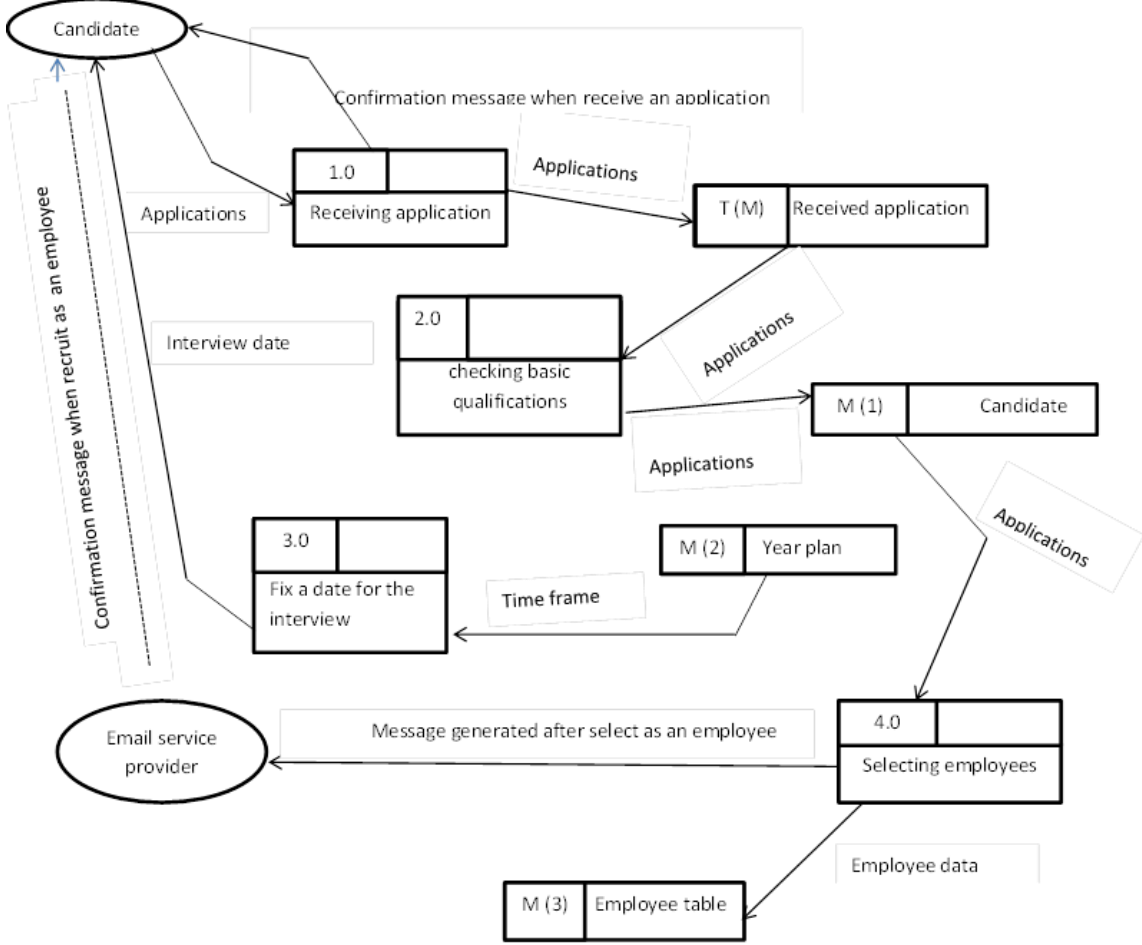
3 a	<table border="1"> <thead> <tr> <th data-bbox="266 249 467 312">Computer lab</th> <th data-bbox="467 249 695 312">IP Address</th> <th data-bbox="695 249 946 312">Subnet masks</th> <th data-bbox="946 249 1339 312">Valid IP addresses</th> </tr> </thead> <tbody> <tr> <td data-bbox="266 312 467 428">ICT</td> <td data-bbox="467 312 695 428">172.16.10.</td> <td data-bbox="695 312 946 428">255.255.255.128</td> <td data-bbox="946 312 1339 428">172.16.10.1 - 172.16.10.126 / 172.16.10.0 - 172. 16. 10. 127</td> </tr> <tr> <td data-bbox="266 428 467 546">Accounting</td> <td data-bbox="467 428 695 546">172.16.10.128</td> <td data-bbox="695 428 946 546">255.255.255.192</td> <td data-bbox="946 428 1339 546">172.16.10.129 - 172.16.10.190/ 172.16.10.128 - 172.16.10.191</td> </tr> <tr> <td data-bbox="266 546 467 693">Human Resource</td> <td data-bbox="467 546 695 693">172.16.10.192</td> <td data-bbox="695 546 946 693">255.255.255.192</td> <td data-bbox="946 546 1339 693">172.16.10.193 – 172.16.10.254/ 172.16.10.192 – 172.16.10.255</td> </tr> <tr> <td colspan="4" data-bbox="266 693 1339 753">or</td> </tr> <tr> <td data-bbox="266 753 467 869">ICT</td> <td data-bbox="467 753 695 869">172.16.10.128</td> <td data-bbox="695 753 946 869">255.255.255.128</td> <td data-bbox="946 753 1339 869">172.16.10.129 - 172.16.10.254 or 172.16.10.128 - 172. 16. 10. 255</td> </tr> <tr> <td data-bbox="266 869 467 987">Accounting</td> <td data-bbox="467 869 695 987">172.16.10.0</td> <td data-bbox="695 869 946 987">255.255.255.192</td> <td data-bbox="946 869 1339 987">172.16.10.1 - 172.16.10.62 or 172.16.10.0 - 172.16.10.63</td> </tr> <tr> <td data-bbox="266 987 467 1102">Human Resource</td> <td data-bbox="467 987 695 1102">172.16.10.67</td> <td data-bbox="695 987 946 1102">255.255.255.192</td> <td data-bbox="946 987 1339 1102">172.16.10.65 - 172.16.10.126 or 172.16.10.64 - 172.16.10.127</td> </tr> <tr> <td colspan="4" data-bbox="266 1102 1339 1163">For each correct row – 2 marks. correct 2 columns only in a row- 1 mark</td> </tr> </tbody> </table>	Computer lab	IP Address	Subnet masks	Valid IP addresses	ICT	172.16.10.	255.255.255.128	172.16.10.1 - 172.16.10.126 / 172.16.10.0 - 172. 16. 10. 127	Accounting	172.16.10.128	255.255.255.192	172.16.10.129 - 172.16.10.190/ 172.16.10.128 - 172.16.10.191	Human Resource	172.16.10.192	255.255.255.192	172.16.10.193 – 172.16.10.254/ 172.16.10.192 – 172.16.10.255	or				ICT	172.16.10.128	255.255.255.128	172.16.10.129 - 172.16.10.254 or 172.16.10.128 - 172. 16. 10. 255	Accounting	172.16.10.0	255.255.255.192	172.16.10.1 - 172.16.10.62 or 172.16.10.0 - 172.16.10.63	Human Resource	172.16.10.67	255.255.255.192	172.16.10.65 - 172.16.10.126 or 172.16.10.64 - 172.16.10.127	For each correct row – 2 marks. correct 2 columns only in a row- 1 mark				2x 3 = 6
Computer lab	IP Address	Subnet masks	Valid IP addresses																																			
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Proxy Server	Fire Wall																																					
c	 <p>The diagram illustrates a network architecture. At the top, a cloud labeled 'Internet' is connected to a 'Router' (cylinder icon). Below the router is a 'Firewall' (rectangle). To the left of the firewall is a 'Proxy Server' (rectangle). Below the firewall is a central 'Switch' (rectangle). This central switch is connected to three other switches: one on the left labeled 'Human Resource', one on the right labeled 'Accounting', and one below it labeled 'Web server'. The 'Web server' is represented by a rectangle with a trapezoidal base.</p>	07 marks																																				

	<p>A-Connection between internet and router-02 marks</p> <p>B-connecting HR department and accounting department into ICT lab-02 marks</p> <p>C-connecting proxy server and web server into ICT lab -02 marks</p> <p>D-connecting all devices correct and not to connect wrong devices-01 mark</p>	
d	IP addresses in the internal network are replaced by real IP addresses which shows into external	01 mark

4.a	<p>Candidate</p> <p>E-mail service provider</p>	01*2=2
b	<p>Received applications</p> <p>Valid applications</p> <p>Employee Table</p> <p>Year Plan</p>	01*3=3
c	<p>Collecting applications</p> <p>Checking basic qualifications of the candidates</p> <p>Set a date for the interview</p> <p>Recruiting new employees</p>	01*3=3

total marks - 07

d



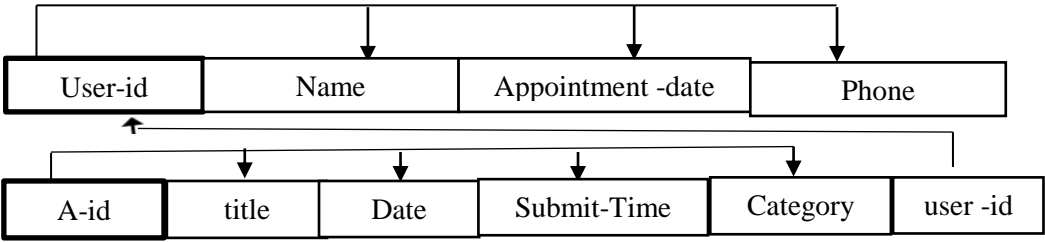
Each process – 0.5 , four process - 0.5*4= 02
 Each data table – 0.5 , four process - 0.5*4= 02
 Each external entity – 01 , two external entities – 01*2= 02
 Data flows – 01 mark

5.a
i

One to Many /1N 2

ii

Article Table → a.bPrimary Key
 Reporter Table → reporter –Id a.bPrimary Key
 reporter _id of the Reporter table is the foreign key of the Article table 2

iii	INSERT INTO REPORTER VALUES (005,'L.M.Mahen,' 2019-08-10, 077-7890356)	2
iv	UPDATE ARTICLE SET Title = 'Sri Lanka Rugby' WHERE A_id = '1121'	2
		3
b	<ul style="list-style-type: none"> Weak Entity <p>If the data of a data store cannot be separated using its field, they are weak entities.(give an example)</p> <ul style="list-style-type: none"> Multivalued Attributes <p>an occasion when deposit few values in one attribute.(give an example)</p>	<p>For explaining with example- 2*2= 4 marks</p>