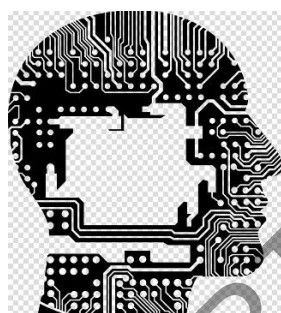


A/L ICT Marking Scheme
2024 – October
2024 (Gr.13) - Term 6



National Field Work Center (NFWC)
Thondaimanaru



*This document /scheme has been prepared for the use of marking examination paper.
Some changes and alternative answers would be made by the teachers.
Amendments to be included.*

Part – I – Suggested Answers

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

Part – II A – Suggested Answers

Question No.		Marks
(1)(a)(i)	• Coffee • Tea ◦ Black tea ◦ Green tea • Milk	2 marks <i>partial marks can be given</i>
(1)(a)(ii)	<pre> <html> <head> <title> Registration </title> </head> <body> <form action="register.php" method="post"> <fieldset> <legend> Register </legend> Full Name: <input type=".....text....." name="name"/> </pre>	3 marks [6 x 0.5] <i>partial marks can be given</i>

	< p> Mail Address: <input type=".....email / text....." name="email"/> </p>
--	--

(2)(b)(i)	① - numbers ② - num ③ - result * num ④ - result	2 marks [4 x 0.5]								
(2)(b)(ii)	<table><tr><th>Variables</th><th>Constants</th></tr><tr><td>Can change value after assignment</td><td>Cannot change value once assigned</td></tr><tr><td>Can be used to store value</td><td>Can be used to store value</td></tr><tr><td>Consists of a name</td><td>Consists of a name</td></tr></table>	Variables	Constants	Can change value after assignment	Cannot change value once assigned	Can be used to store value	Can be used to store value	Consists of a name	Consists of a name	2 marks Alternative answers accepted
Variables	Constants									
Can change value after assignment	Cannot change value once assigned									
Can be used to store value	Can be used to store value									
Consists of a name	Consists of a name									
(2)(c)	1 - D 2 - A 3 - C 4 - B	2 marks [4 x 0.5]								
(3)(a)(i)	3NF Because, It has no transitive dependancy or Every non-key attribute is dependant on primary key or Every determinant is key. DepName → Manager	1.5 marks								
(3)(a)(ii)	Correct. Because, It has no transitive dependancy or Every non-key attribute is dependant on primary key or Every determinant is key. ID → FirstName, LastName, DepName	1.5 marks								
(3)(b)(i)	It is a weak entity or It does not have any own attribute to identify its instances.	1 marks								
(3)(b)(ii)	Bcode+BranchNo	1 marks								
(3)(b)(iii)	Bank (Bcode, Name, Address) Branch (Bcode, BranchNo)	2 marks								

(3)(c)	(i) Mobile marketing - நடமாடும் சந்தைப்படுத்தல் (ii) Competitive advantage - போட்டியிடை அனுகூலம் (iii) Subscription as a revenue model - வருவான மாதிரியமாக சந்தா (iv) Web portal - வலை வாசல் (v) e-marketing - மின் சந்தைப்படுத்தல் (vi) Brick-and-mortar business - பிறிக் மற்றும் மோட்டார் வியாபாரம்	3 marks [6 x 0.5]
(4) (a)	① Customer - வாடிக்கையாளர் ② Customer details - வாடிக்கையாளர் விபரம் / விபரங்கள் ③ Supplier - விநியோகஸ்தர் ④ Payment or Invoice - பணக்கொடுப்பனவு or கொடுப்பனவு or விலைப்பட்டியல் ⑤ Preparing and agreeing estimate - மதிப்பீட்டினைத் தயாரித்தல் or உருவாக்குதல் ⑥ Agreed estimate - ஏற்றுக்கொள்ளப்பட்ட மதிப்பீடு ⑦ Materials provided - கட்டுமானப் பொருட்கள் ⑧ Job schedule - வேலை அட்டவணை / காலம் ⑨ Start date confirmation - உறுதி செய்யப்பட்ட தொடக்க திகதி ⑩ Customer name - வாடிக்கையாளர் பெயர் Note: ⑤ - should be in verb form ① - should be in singular noun Others should be noun (whether singular or plural)	5 marks [10 x 0.5]
(4)(b)(i)	2 ²⁰	2 marks
(4)(b)(ii)	2 ¹⁸	1 marks
(4)(b)(iii)	4MB	2 marks

Part – II B – Suggested Answers

Question No.																																																																																																					
(5)(a)(i)	<table><tr><th>A</th><th>B</th><th>C</th><th>$\bar{A}$</th><th>$\bar{B}$</th><th>$\bar{C}$</th><th>$\bar{A}\bar{B}\bar{C}$</th><th>$\bar{A}\bar{B}C$</th><th>$\bar{A}B\bar{C}$</th><th>$A\bar{B}\bar{C}$</th><th>Z</th></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}\bar{B}\bar{C}$	$\bar{A}\bar{B}C$	$\bar{A}B\bar{C}$	$A\bar{B}\bar{C}$	Z	0	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1	0	0	1	0	0	1	0	1	0	1	0	1	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	4 marks 0.5 for each rows
A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}\bar{B}\bar{C}$	$\bar{A}\bar{B}C$	$\bar{A}B\bar{C}$	$A\bar{B}\bar{C}$	Z																																																																																											
0	0	0	1	1	1	1	0	0	0	1																																																																																											
0	0	1	1	1	0	0	1	0	0	1																																																																																											
0	1	0	1	0	1	0	0	1	0	1																																																																																											
0	1	1	1	0	0	0	0	0	0	0																																																																																											
1	0	0	0	1	1	0	0	0	1	1																																																																																											
1	0	1	0	1	0	0	0	0	0	0																																																																																											
1	1	0	0	0	1	0	0	0	0	0																																																																																											
1	1	1	0	0	0	0	0	0	0	0																																																																																											
(5)(a)(ii)		2 marks																																																																																																			
(5)(a)(iii)	$\bar{A}\bar{B} + \bar{B}\bar{C} + \bar{A}\bar{C}$	2 marks																																																																																																			
(5)(a)(iv)	$(\bar{A} + \bar{B}) + (\bar{B} + \bar{C}) + (\bar{A} + \bar{C})$	2 marks																																																																																																			
(5)(b)(i)	$\begin{aligned} &A\bar{B} + (\bar{A} + \bar{B} + C.\bar{C}) \\ &= A\bar{B} + (\bar{A} + \bar{B} + 0) \\ &= A\bar{B} + (\bar{A} + \bar{B}) \\ &= A\bar{B} + \bar{A}.\bar{B} \\ &= A\bar{B} + AB \\ &= A.(\bar{B} + B) \\ &= A.1 \\ &= A \end{aligned}$	3 marks																																																																																																			
(5)(b)(ii)	$\begin{aligned} &A+(B+C)=(A+B)+C \\ &A.(B.C)=(A.B).C \end{aligned}$	2 marks																																																																																																			

(6)(a)	• Logical Addressing (IP Addressing) • Routing • Packet Forwarding • Fragmentation and Reassembly • Path Determination • Quality of Service (QoS) • Inter-networking	4 marks <i>Alternative answers accepted</i>																									
(6)(b)	1. Low Latency 2. No Overhead from Error Correction 3. No Congestion Control 4. Out-of-order Packet Tolerance 5. Multicasting Support 6. Lightweight Protocol	2 marks <i>Alternative answers accepted</i>																									
(6)(c)	<table><tr><th>Departments</th><th>Network address</th><th>Broadcast address</th><th>Subnet mask</th><th>Usable IP address range</th></tr><tr><td>Information system</td><td>192.248.16.0</td><td>192.248.16.31</td><td>255.255.255.224</td><td>192.248.16.1 - 192.248.16.30</td></tr><tr><td>Production</td><td>192.248.16.32</td><td>192.248.16.63</td><td>255.255.255.224</td><td>192.248.16.33 - 192.248.16.62</td></tr><tr><td>Marketing</td><td>192.248.16.64</td><td>192.248.16.95</td><td>255.255.255.224</td><td>192.248.16.65 - 192.248.16.94</td></tr><tr><td>Accounting</td><td>192.248.16.96</td><td>192.248.16.127</td><td>255.255.255.224</td><td>192.248.16.97 - 192.248.16.126</td></tr></table>	Departments	Network address	Broadcast address	Subnet mask	Usable IP address range	Information system	192.248.16.0	192.248.16.31	255.255.255.224	192.248.16.1 - 192.248.16.30	Production	192.248.16.32	192.248.16.63	255.255.255.224	192.248.16.33 - 192.248.16.62	Marketing	192.248.16.64	192.248.16.95	255.255.255.224	192.248.16.65 - 192.248.16.94	Accounting	192.248.16.96	192.248.16.127	255.255.255.224	192.248.16.97 - 192.248.16.126	3 marks <i>[Each row takes 1 marks]</i>
Departments	Network address	Broadcast address	Subnet mask	Usable IP address range																							
Information system	192.248.16.0	192.248.16.31	255.255.255.224	192.248.16.1 - 192.248.16.30																							
Production	192.248.16.32	192.248.16.63	255.255.255.224	192.248.16.33 - 192.248.16.62																							
Marketing	192.248.16.64	192.248.16.95	255.255.255.224	192.248.16.65 - 192.248.16.94																							
Accounting	192.248.16.96	192.248.16.127	255.255.255.224	192.248.16.97 - 192.248.16.126																							
(6)(d)	<table><tr><th>Aspect</th><th>IP Address</th><th>MAC Address</th></tr><tr><td>Type of Address</td><td>Logical address, assigned by the network or administrator</td><td>Physical address, embedded in the network interface card (NIC) by the manufacturer</td></tr><tr><td>Layer in OSI Model</td><td>Layer 3 (Network Layer)</td><td>Layer 2 (Data Link Layer)</td></tr><tr><td>Format</td><td>IPv4: 32-bit (e.g., 192.168.1.1), IPv6: 128-bit (e.g., 2001:db8::1)</td><td>48-bit hexadecimal (e.g., 00:1A:2B:3C:4D:5E)</td></tr><tr><td>Scope</td><td>Used to route packets between different networks (global scope)</td><td>Used to identify devices within the same local network (local scope)</td></tr><tr><td>Modifiability</td><td>Can be dynamically changed (using DHCP) or manually assigned</td><td>Fixed, hardcoded into the hardware (can be spoofed but not easily changed)</td></tr><tr><td>Addressing Hierarchy</td><td>Hierarchical (contains network and host portions)</td><td>Flat, no hierarchy (each address is unique)</td></tr></table>	Aspect	IP Address	MAC Address	Type of Address	Logical address, assigned by the network or administrator	Physical address, embedded in the network interface card (NIC) by the manufacturer	Layer in OSI Model	Layer 3 (Network Layer)	Layer 2 (Data Link Layer)	Format	IPv4: 32-bit (e.g., 192.168.1.1), IPv6: 128-bit (e.g., 2001:db8::1)	48-bit hexadecimal (e.g., 00:1A:2B:3C:4D:5E)	Scope	Used to route packets between different networks (global scope)	Used to identify devices within the same local network (local scope)	Modifiability	Can be dynamically changed (using DHCP) or manually assigned	Fixed, hardcoded into the hardware (can be spoofed but not easily changed)	Addressing Hierarchy	Hierarchical (contains network and host portions)	Flat, no hierarchy (each address is unique)	4 marks <i>Alternative answers accepted</i>				
Aspect	IP Address	MAC Address																									
Type of Address	Logical address, assigned by the network or administrator	Physical address, embedded in the network interface card (NIC) by the manufacturer																									
Layer in OSI Model	Layer 3 (Network Layer)	Layer 2 (Data Link Layer)																									
Format	IPv4: 32-bit (e.g., 192.168.1.1), IPv6: 128-bit (e.g., 2001:db8::1)	48-bit hexadecimal (e.g., 00:1A:2B:3C:4D:5E)																									
Scope	Used to route packets between different networks (global scope)	Used to identify devices within the same local network (local scope)																									
Modifiability	Can be dynamically changed (using DHCP) or manually assigned	Fixed, hardcoded into the hardware (can be spoofed but not easily changed)																									
Addressing Hierarchy	Hierarchical (contains network and host portions)	Flat, no hierarchy (each address is unique)																									
(6)(e)	• Efficient use of IP addresses (customizable subnet sizes). • Better scalability for future network growth. • Reduced wastage of IP addresses. • Support for complex and hierarchical network designs. • More efficient routing (fewer routing table entries).	2 marks <i>Alternative answers accepted</i>																									

(7)(a)(i)	A PIR (Passive Infrared) sensor is used in primarily for motion detection . It detects the infrared (IR) radiation emitted by objects, particularly humans, and is commonly used for detecting movement in a defined area.	2 marks
(7)(a)(ii)	When Human moves before PIR sensor, it automatically light on LED .	1 marks
(7)(a)(iii)	❶ - sensor ❷ - HIGH ❸ - LOW ❹ - else	2 marks
(7)(b)(i)	B2C / Business to customer / Business to consumer	1 marks
(7)(b)(ii)	- Faster buying process - Cost reduction - Affordable advertising and marketing - Flexibility for customers - No reach limitations - Product and price comparison - Faster response to buyer/market demands - Several payment modes - Enables easy exports 24/7 service	2 marks <i>[1+1]</i> <i>Alternative answers accepted</i>
(7)(a)(iii)	Online sales revenue model, Online transaction revenue model, Online advertising revenue model.	2 marks <i>[1+1]</i>
(7)(c)(i)	<pre> graph LR Customer((Customer)) --> ChatBot((Chat-bot)) ChatBot --> ExtractionAgent((Extraction agent)) ExtractionAgent --> SearchAgent((Search agent)) SearchAgent -- "Search results" --> SubAgent1((Sub-agent 1)) SearchAgent -- "Search results" --> SubAgent2((Sub-agent 2)) SearchAgent -- "Search results" --> SubAgentN((Sub-agent N)) SubAgent1 -- "Search results" --> SearchAgent SubAgent2 -- "Search results" --> SearchAgent SubAgentN -- "Search results" --> SearchAgent SearchAgent -- "Search results" --> Customer </pre>	4 marks <i>Customer – 0.5, chatbot – 0.5, Extraction agent – 0.5, Search agent – 0.5, sub-agent – 0.5, arrow directions, search results – 1.5</i>

(7)(c)(ii)	Extraction agent – பிரித்தெடுப்பு முகவர், Search agent – தேடல் முகவர், Sub agent – உப முகவர்	1 marks									
(8)(a)	The ER diagram shows four entities: manufacturer (attributes: street, city, address, name), sparepart (attributes: partnumber, description), customer (attributes: customernumber, name), and order (attribute: ordernumber). Relationships are: made by (1:M), contains (M:N), and orders (1:M).	6 marks [four entities – 2 marks, three relationships - 1.5 marks, cardinalities - 1 marks, attributes – 1.5 marks]									
(8)(b)(i)	1 NF (1 st normal form) Because the table contains partial dependency CourseID → CourseName and it is in 1 NF , has no repeating groups.	2 marks [1+1]									
(8)(b)(ii)	Student (<u>StudentID</u>) Course (<u>CourseID</u> , CourseName, InstructorID) Instructor (<u>InstructorID</u> , InstructorName) Student_Course (<u>StudentID</u> , <u>CourseID</u>)	4 marks									
(8)(c)(i)	DELETE FROM Persons WHERE PersonID = 'P003';	2 marks									
(8)(c)(ii)	<table border="1"> <thead> <tr> <th>PersonID</th><th>FirstName</th><th>City</th></tr> </thead> <tbody> <tr> <td>P003</td><td>Jamuna</td><td>Jaffna</td></tr> <tr> <td>P005</td><td>Vimali</td><td>Jaffna</td></tr> </tbody> </table>	PersonID	FirstName	City	P003	Jamuna	Jaffna	P005	Vimali	Jaffna	1 marks
PersonID	FirstName	City									
P003	Jamuna	Jaffna									
P005	Vimali	Jaffna									

(9)(a)(i)	Phase deployment	2 marks															
(9)(a)(ii)	- Reduced Risk of Failure - Easier Bug Detection and Resolution - User Feedback and Iteration - Improved Resource Management - Enhanced User Experience - Gradual Change Management	2 marks <i>Alternative answers accepted</i>															
(9)(a)(iii)	- Complexity in Management - Resource Intensive - Potential for Inconsistent User Experience - Extended Deployment Timeline	2 marks <i>Alternative answers accepted</i>															
(9)(b)	Technical feasibility, Schedule feasibility, Economical feasibility	3 marks															
(9)(c)(i)	Acceptance testing is essential for validating that software meets user requirements and is ready for deployment. It is primarily conducted by end users or clients, supported by the QA team and other stakeholders, to ensure that the software functions correctly and effectively before it is released to the broader user base.	2 marks															
(9)(c)(ii)	<table border="1"> <thead> <tr> <th>Characteristic</th><th>Waterfall Model</th><th>Agile Model</th></tr> </thead> <tbody> <tr> <td>Approach to Development</td><td>Sequential and linear</td><td>Iterative and incremental</td></tr> <tr> <td>Flexibility</td><td>Less flexible; difficult to make changes after a phase is completed</td><td>Highly flexible; changes can be made easily throughout the process</td></tr> <tr> <td>User Involvement</td><td>Limited to requirements and acceptance testing</td><td>Continuous involvement and feedback from users</td></tr> <tr> <td>Feedback Timing</td><td>Feedback gathered after completion</td><td>Frequent feedback throughout development</td></tr> </tbody> </table>	Characteristic	Waterfall Model	Agile Model	Approach to Development	Sequential and linear	Iterative and incremental	Flexibility	Less flexible; difficult to make changes after a phase is completed	Highly flexible; changes can be made easily throughout the process	User Involvement	Limited to requirements and acceptance testing	Continuous involvement and feedback from users	Feedback Timing	Feedback gathered after completion	Frequent feedback throughout development	4 marks <i>Alternative answers accepted</i>
Characteristic	Waterfall Model	Agile Model															
Approach to Development	Sequential and linear	Iterative and incremental															
Flexibility	Less flexible; difficult to make changes after a phase is completed	Highly flexible; changes can be made easily throughout the process															
User Involvement	Limited to requirements and acceptance testing	Continuous involvement and feedback from users															
Feedback Timing	Feedback gathered after completion	Frequent feedback throughout development															

(10)(a)	<pre> graph TD Start([Start]) --> i0[i = 0] i0 --> EnterN[/Enter a number, N/] EnterN --> IsIN{Is i < N ?} IsIN -- No --> End([End]) IsIN -- Yes --> EnterS[/Enter subject marks, S/] EnterS --> IsS100{Is S <= 100 ?} IsS100 -- No --> iplus[i = i + 1] IsS100 -- Yes --> displayS[/display S/] displayS --> iplus iplus --> IsIN </pre>	6 marks
(9)(b)(i)	7	2 marks
(9)(b)(ii)	Displaying <u>number of values</u> in the list that are <u>greater than 3</u> .	2 marks
(9)(b)(iii)	<pre> L = [5, 4, 7, 4, 4, 3, 2, 1, 5, 6] S = int(input('Enter a number:')) count = 0 j = 0 N = len(L) while j < N: if L[j] > S: count = count + 1 j = j + 1 print(count) </pre>	5 marks [0.5 marks for each line]

Final Marks Distributions

Part – I 2 x 50 = **100 marks** **Part – II A** 10 x 4 = **40 marks** **Part – II B** 15 x 4 = **60 marks**

Total: 200 / 2 = 100 marks
