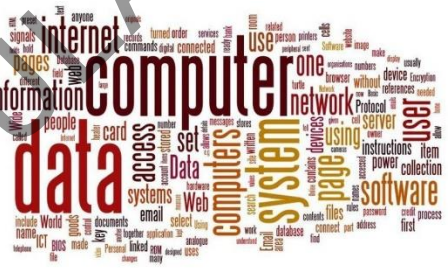
A/L ICT 2024

Marking Scheme

FWC Examination

Term – 4 (May 2024)



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

Part – I Suggested Answers

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

Note: (5) TM - Open

Part – II A – Suggested Answers

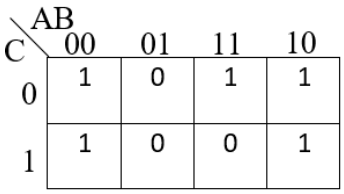
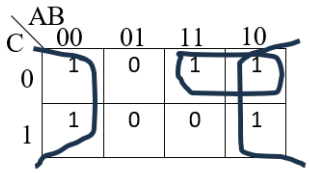
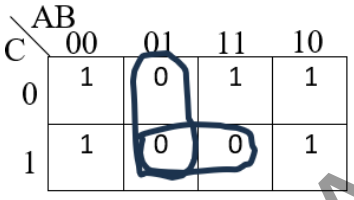
Question No.		Marks
(1)(a)	**1. Fetching instructions** **2. Decoding instructions** **3. Excuting instructions**	**3 marks [1 x 3]**
(1)(b)	• **Accessibility anywhere, with any device** • **Ability to get rid of most or all hardware and software.** • **Centralized data securit** • **Higher performance and availability** • **Quick application deployment** • **Instant business insights** • **Business continuity** • **Price-performance and cost savings.**	**2 marks [1 x 2]**

<table>
<tr><td>(1)(c)</td><td>20_{10} = 00010100_2
-13_{10} = 11110011_2
00000111_2
Discard carry bit 1</td><td>2 marks</td></tr>
<tr><td>(1)(d)(i)</td><td><table><tr><th>A</th><th>B</th><th>X</th><th>Y</th><th>R</th></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td></tr></table></td><td>1.5 marks
0.5 for each column</td></tr>
<tr><td>(1)(d)(ii)</td><td>XOR gate</td><td>0.5 marks</td></tr>
<tr><td>(1)(e)</td><td>• Source code is available
• Code can be distributed, modified, or studied
• Cost benefits
• Scalability</td><td>1 marks
[0.5 x 2]</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>(2)(a)</td><td>① Is B>0 and H>0?
② Area = ½ x B x H
③ Display Area</td><td>3 marks
[3 x 1]</td></tr>
<tr><td>(2)(b)</td><td>(i) ③
(ii) ②
(iii) ⑤ / ②
(iv) ④
(v) ①</td><td>5 marks
[1 x 5]</td></tr>
</table>

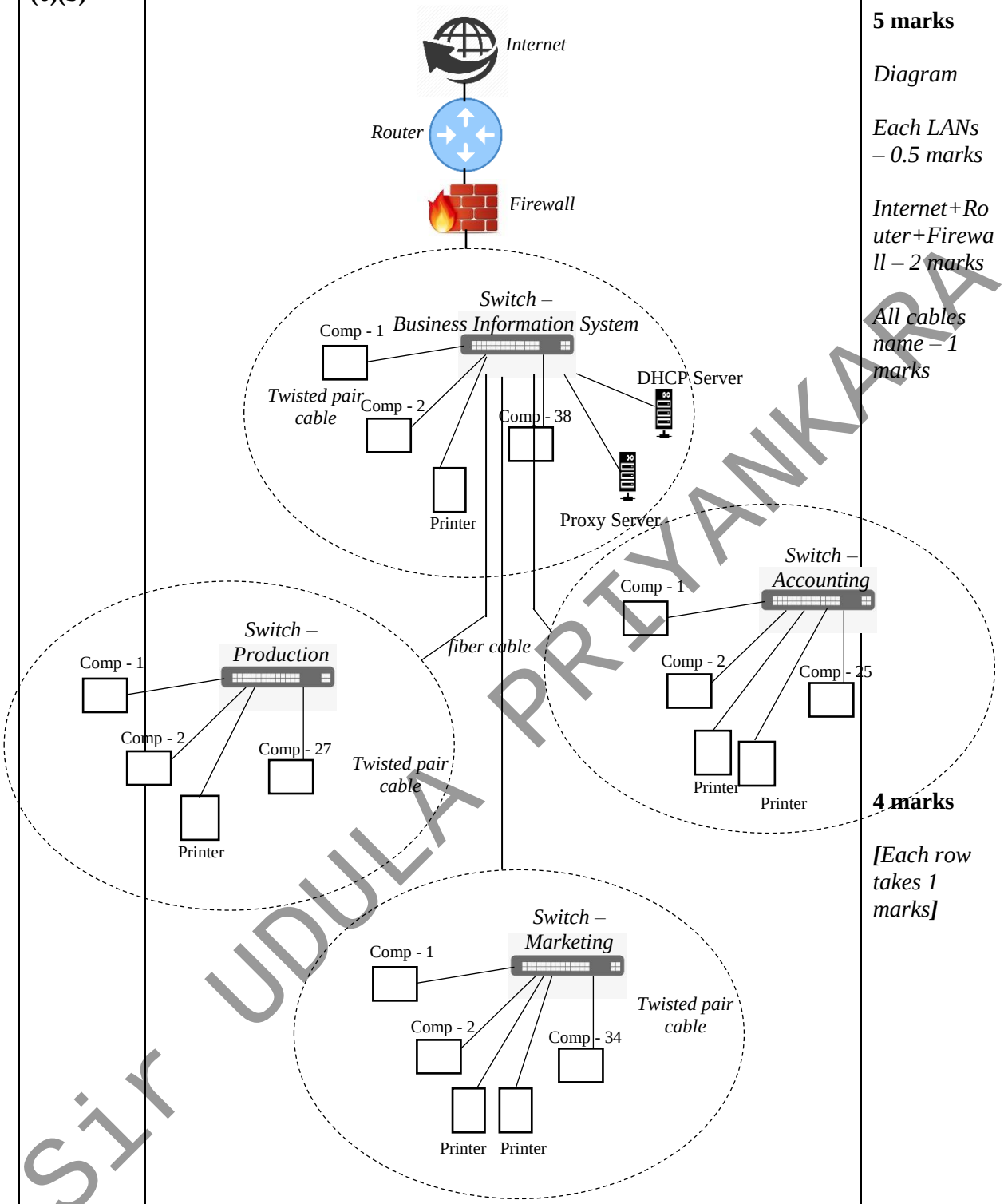
(2)(c)	**Space needed for 4 blocks = 4 x 124 = 496 bytes** **Additional 4 bytes are needed for pointers / links among blocks.**	**2 marks**
(3)(a)	**A - Presentation layer** **B - Session layer** **C - Transport layer** **D - Datalink layer** **E - Physical layer** **F - Application layer** **G - Transport layer** **H - Internet layer**	**4 marks** **[0.5 x 8]**
(3)(b)	**(i) NAT** **(ii) Firewall** **(iii) Phishing** **(iv) Ransomware** **(v) Multiplexing**	**5 marks**
(3)(c)	**No.** **Because parity bit method does not find burst errors (more than one bit errors).**	**1 marks** **[0.5 x 2]**
(4) (a)	• **Reduces redundant data.** • **Coontrol of data anomaly [delete / update / insert]** • **ACID.** • **Provides data consistency within the database.** • **More flexible database design.**	**2 marks [1 x 2]** *Or any other appropriate answers accepted.*

	• Higher database security. • Better and quicker execution. • Greater overall database organization.	
(4)(b)(i)	If we wish to insert a new van details, the details about drivers must be entered or If we wish to insert a new driver details, the details about van must be entered.	1 marks
(4)(b)(ii)	The dependency of a non-key attribute on only a subset of the attributes involved in a composite key. • DriverID → DriverName • VanID → VanMake	3 marks [1+1+1]
(4)(b)(iii)	• Driver (DriverID, DriverName) • Van (VanID, VanMake) • Driver_Van (DriverID, VanID, Mileage)	3 marks [1 x 3]
(4)(c)	① Member details ② Borrowing / getting books ③ Fine ④ Reserving books ⑤ Fine ⑥ Reservation details	3 marks [0.5 x 6]

Part – II B – Suggested Answers

Question No.		
(5)(a)(i)		**4 marks**
(5)(a)(ii)	 $A\bar{C} + \bar{B}$	**4 marks**
(5)(a)(iii)	 $(A + \bar{B})(\bar{B} + \bar{C})$	**4 marks**
(5)(iv)	(ii) / SOP Because a number of logic gates are needed lesser than POS.	**3 marks**

(6)(b)



5 marks

Diagram

Each LANs – 0.5 marks

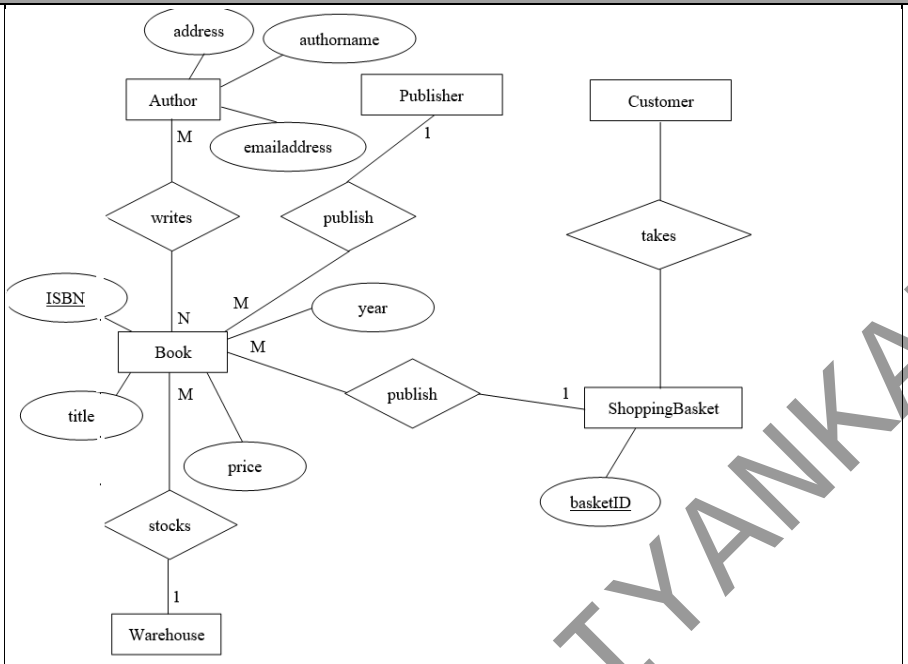
Internet+Router+Firewall – 2 marks

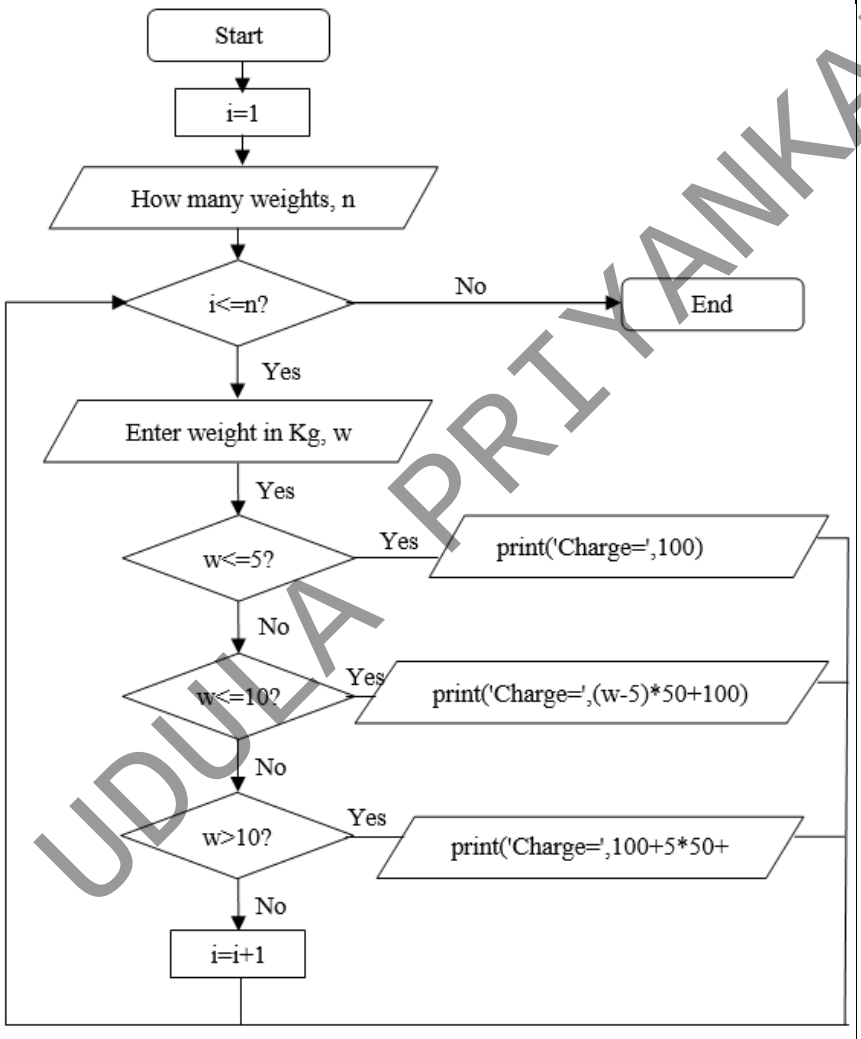
All cables name – 1 marks

4 marks

[**Each row takes 1 marks**]

<table>
<tr><td></td><td>
<table>
<tr><th>Department</th><th>Network address</th><th>Broadcast address</th><th>Subnet mask</th><th>Usable IP address range</th></tr>
<tr><td>Business information system</td><td>192.147.1.0</td><td>192.147.1.63</td><td>255.255.255 .192</td><td>192.147.1.1 - 192.147.1.62</td></tr>
<tr><td>Accounting</td><td>192.147.1.64</td><td>192.147.1.127</td><td>255.255.255 .192</td><td>192.147.1.65 - 192.147.1.126</td></tr>
<tr><td>Production</td><td>192.147.1.128</td><td>192.147.1.191</td><td>255.255.255 .192</td><td>192.147.1.129 - 192.147.1.190</td></tr>
<tr><td>Marketing</td><td>192.147.1.192</td><td>192.147.1.255</td><td>255.255.255 .192</td><td>192.147.1.193 - 192.147.1.254</td></tr>
</table>
</td><td></td></tr>
<tr><td>(6)(b)</td><td>• More efficient use of allocated IP address space.
• Multiple networks can be shared with a single 'summary' address which reduces routing table size and makes route lookups faster.</td><td>1 marks</td></tr>
<tr><td>(6)(c)(i)</td><td>• Proxy servers act as a firewall and web filter.
• It provides shared network /Internet connections.
• It caches data to speed up common requests.
• It keeps users and the internal network protected from the bad stuff.</td><td>1 marks</td></tr>
<tr><td>(6)(c)(ii)</td><td>• Assigning Logical Address / IP address
• Routing
• Host-to-Host delivery
• Logical Subnettin
• Fragmentation and Reassembly
• Error Handling
• Quality of Service (QoS)
• Network Address Translation (NAT)</td><td>2 marks</td></tr>
<tr><td>(6)(c)(iii)</td><td>• Router <u>connects different network</u> types
• It joins networks with different network addresses
• Forwards packes via less congestion paths
• It finds the <u>shortest path</u> to send packets to the destination
• It defines logical address schemes
• Router supports VLANs</td><td>2 marks</td></tr>
</table>

	• The router has features like Quality of Service (QoS) and filtering • It builds routing tables to make layer 3 decisions fast	
(7)(a)		**9 marks** *[entities – 3 marks, relationships - 2.5 marks, cardinalities – 1.5 marks, attributes – 2 marks]*
(7)(b)(i)	A table should be in 2NF AND It has no transitive dependency OR Every key is a determinant	**1 marks**
(7)(b)(ii)	• Patient (PatientNo, PatientName) • Test (TestType, Charge) • Patient_Test (PatientNo,TestType, TreatmentDate)	**2 marks** *[1+1+1]*
(7)(c)(i)	INSERT INTO EMPLOYEE VALUES(‘e_05’,’Rajaratnam’,’SysEng.’,’IT’,120000); OR INSERT INTO EMPLOYEE(EmpNo,EmpName,Position,Department,BasicSalary) VALUES(‘e_05’,’Rajaratnam’,’SysEng.’,’IT’,120000);	**1 marks**

(7)(c)(ii)	SELECT * FROM EMPLOYEE WHERE BasicSalary >= 60000;	**1 marks**
(7)(c)(iii)	SELECT dept, SUM(BasicSalary), COUNT(EmpNo) FROM EMPLOYEE GROUP BY dept;	**1 marks**
(8)(a)		**6 marks**
(8)(b)(i)	120	**2 marks**
(8)(b)(ii)	Finding factorial of a given value. **or**	**3 marks**

	Finding the multiplication of all the integers from 1 to the given input value.	
(8)(c)	A **program translators are needed** to perform the translation of a program (**source code**) written in high-level programming language into a **machine understandable code/object code.**	**4 marks** *Or equivalent explantion accepted*
(9)(a)	A Process Control Block in OS (PCB) is a **data structure** used by an operating system (OS) to **manage and control the execution of processes**. It contains all the necessary information about a process, including: • Process state • Process ID • Program counter • Memory allocation • Open files • CPU scheduling information, etc.	**4 marks**
(9)(b)	**(i)** 16 **(ii)** 4 bits **(iii)** 3 bits **(iv)** 12 bits **(v)** The program size could be larger than the size of the physical memory **(vi)** That page would not have been accessed before. That page would have got removed from physical memory.	**7 marks [1,1,1,1,1,2]**
(9)(c)	• Simple • Easy Access • File size is needed to know at the time of creation • Extending file size is difficult • External fragmentation (free unusable space between allocation)	**2 marks**
(9)(d)	1. The execution state of the currently-executing process is saved (old process) in PCB. 2. A new process is selected for execution. 3. The execution state of the new process is restored. 4. Control is passed to the new process.	**2 marks**

(10)(a)

Black Box Testing	White Box Testing
It is a way of software testing in which the internal structure or the program or the code is hidden and nothing is known about it.	It is a way of testing the software in which the tester has knowledge about the internal structure or the code or the program of the software.
Implementation of code is not needed for black box testing.	Code implementation is necessary for white box testing.
It is mostly done by software testers.	It is mostly done by software developers.
No knowledge of implementation is needed.	Knowledge of implementation is required.
It can be referred to as outer or external software testing.	It is the inner or the internal software testing.
It is a functional test of the software.	It is a structural test of the software.
No knowledge of programming is required.	It is mandatory to have knowledge of programming.
It is the behavior testing of the software.	It is the logic testing of the software.
It is also called closed testing.	It is also called as clear box testing.
It is least time consuming.	It is most time consuming.

3 marks

(10)(b)

Functional requirements – A,B,E,F
Non-functional requirements – C,D,G,H

8 marks
[1x8]

(10)(c)	• Difficult to accommodate new changes • No overlapping of phases • At the end of the development only, user can get experience with software • Not suitable for complex projects • Limited stakeholder / user involvement • Limited flexibility • Lengthy development cycle	**4 marks**

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**

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