A/L ICT 2024 (Gr.12)

Marking Scheme

February – 2024 Examination

Field Work Center (FWC)

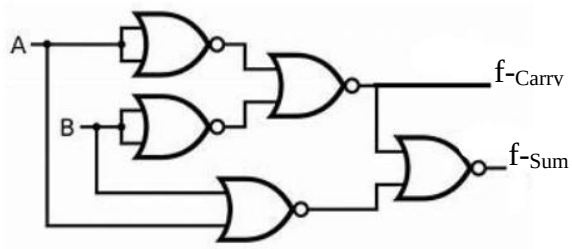
Sir UDULA PRIYANKARA

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.

(1)	**5**	**(11)**	**3**	**(21)**	**5**
(2)	**3**	**(12)**	**2**	**(22)**	**3**
(3)	**4**	**(13)**	**4**	**(23)**	**5**
(4)	**2**	**(14)**	**4**	**(24)**	**2**
(5)	**5**	**(15)**	**4**	**(25)**	**3**
(6)	**4**	**(16)**	**3**	**(26)**	**4**
(7)	**3**	**(17)**	**2**	**(27)**	**4**
(8)	**2**	**(18)**	**5**	**(28)**	**2**
(9)	**4**	**(19)**	**1**	**(29)**	**3**
(10)	**1**	**(20)**	**4**	**(30)**	**4**

[1 x 30 = 30 Marks]

Part – II A

Question No.		Marks
(1)(a)	A : Interrupt B : Scheduler dispatch C : I/O or event completion D : I/O or event wait	**2 Marks** [0.5 x 4]
(1)(b)	**SaaS** – Software as a Service **PaaS** – Platform as a Service **IaaS** – Infrastructure as a Service	**2 Marks** [No partial Marks]
(1)(c) (i)	<table><tr><th>A</th><th>B</th><th>f-Sum</th><th>f-Carry</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td>1</td></tr></table>	**2 Marks** [No partial Marks]
(1)(c)(ii)	$f\text{-}_{Sum} = \overline{A}B + A\overline{B}$ $f\text{-}_{Carry} = AB$	**2 Marks** [1 x 2]
(1)(c)(iii)		**2 Marks** [1 x 2]

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(2)(i)	17_{10} → 00010001	**1 Mark**
(2)(ii)	25 → 00011001 1's Com.(-25) → 11100110 2's Com.(-25) → + 1 11100111	**2 Marks**
(2)(iii)	$17_{10} + (-25_{10})$ → 00010001 +11100111 11111000	**2 Marks**
(2)(iv)	11111000 ← 2's Com. - 1 11110111 ←1's Com. **MSB/Sign Bit 1→ -Ve** 00001000 ← Normal Form -8	**3 Marks**
(2)(v)	11010101 AND 00101010 = 00000000 11010101 OR 00101010 = 11111111	**2 Marks** [1 x 2]
(3) (a)	A : Presentation Layer B : Transport Layer C : Network Layer D : Physical Layer E : Application Layer F : Network Access Layer	**3 Marks** [0.5 x 6]
(3) (b)	**0**1011101 Odd Parity Bit	**2 Marks**

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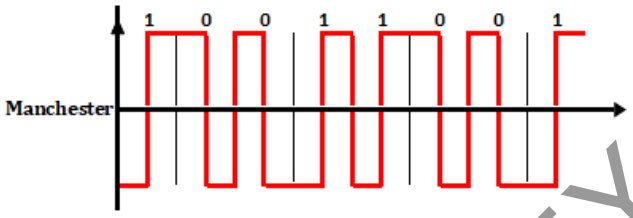
	○ **1 mark** for adding 0 as the parity bit (Ignore the position where the parity bit is added) ○ **1 mark** for receiver has to get the total number of bits odd; if not error	
3) (c)	P : 4 Q : 5 R : 2 S : 1 T : 3	**3 Marks** [0.5x5 = 2.5, 0.5 for Completeness]
3) (d)		**2 Marks**
(4)(a)	P : Membership Card Q : Request for Video R : Payment S : Video	**4 Marks** [1x4]
(4)(b)	X : Customer File Y : Inventory File	**2 Marks** [1x2]
(4)(c)(i)	Any **two** from the following **White box** / **Black box** code remains visible to testers / code remains hidden from testers a low-level testing that involves detailed testing of code / high-level testing that does not involve detailed program level testing Generally done by developers / Generally done by independent testers/users Design documents are usually used for testing / Specification document is required for testing Tests the logic and implementation of software / Tests functionality of software Programming knowledge and implementation details are required / Prior knowledge of programming is not required Types of tests include path testing, control structure testing, loop testing, conditions testing / Types of tests: boundary value analysis, comparison tests etc Generally tesing tools depend on programming language / Generally tesing tools are independent of programming language Note: No partial marks. Comparison must involve both types.	**2 Marks** [1x2]

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(4)(c)(ii)

2 Marks
[1x2]

Any **two** from the following

Parallel	**Pilot**
Old and the new systems are run alongside each other for a period of time	Usually only the new system is run
Usually run covering the full set of users	Covers only a limited set of users
Cost is usually more as two systems need to be running	Cost is usually lesser
Comparatively quicker to implement	Takes longer to implement the entire system to cover the entire set of users
Duplication of effort to run both systems	Lesser duplication of effort
Less riskier as, if the new system fails, the old system still exists	More risky
No feedback from a pilot run	Feedback from the pilot run can be used in system improvement
More effort required for training users as there are no users with prior experience	The users involved in the pilot can help train the other users
Viability of the system not indicated before implementing for the whole set of users	Results from the pilot can help decide the viability of the system
If the new system does not work then big waste of money and effort	Relatively lesser money and effort wastage if the new system does not work
More difficult to manage as the implementation is on a larger scale	More easier to manage as the implementation is on a smaller scale
More cost involved in training as more staff need to be trained at once	Staff can be trained gradually from area to area
Users can can compare the output of the old system with the output of the new system, to ensure correctness	There is nothing to compare
Data could be different in the old and the new systems due to mistakes in data entry	No such risk
Scalability testing is automatically done	The system that works for a small area may not work for the entire area

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Part – II B

Question No.

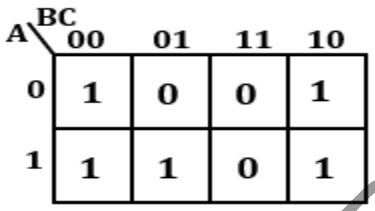
(1)(i) — **1 Mark**

$$F = \bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + A\bar{B}C + \bar{A}\bar{B}\bar{C} + AB\bar{C}$$

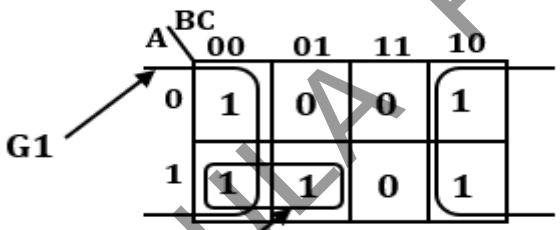
4 Marks [0.5 for each row]

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}\bar{B}\bar{C}$	$A\bar{B}\bar{C}$	$A\bar{B}C$	$\bar{A}\bar{B}C$	$AB\bar{C}$	F
0	0	0	1	1	1	1	0	0	0	0	1
0	0	1	1	1	0	0	0	0	0	0	0
0	1	0	1	0	1	0	0	0	1	0	1
0	1	1	1	0	0	0	0	0	0	0	0
1	0	0	0	1	1	0	1	0	0	0	1
1	0	1	0	1	0	0	0	1	0	0	1
1	1	0	0	0	1	0	0	0	0	1	1
1	1	1	0	0	0	0	0	0	0	0	0

(1)(ii) — **2 Marks** [Deduct 1 marks if "0" is not placed]

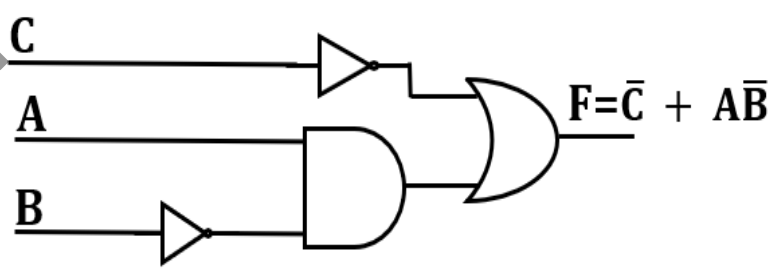


(1)(iii) — **3 Marks** [Correctly marking two loops 1 mark for each, Simplified final SOP expression 1 mark]



$$F = \bar{C} + A\bar{B}$$

(1)(iv) — **2 Marks**



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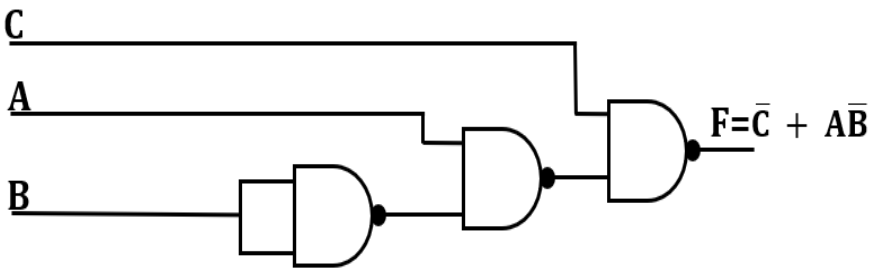
(1)(v) — **3 Marks**



(2) (i) — **1 Mark**

$2^7 = 128$

(2) (ii) — **2 Marks** [1, 1]

192.168.50.0 – 192.168.50.127

(2) (iii) — **1 Mark**

11111111.11111111.11111111.10000000
255.255.255.128

(2) (iv) — **4 Marks** [1 for each row]

Subnet Number	Network Address	Subnet Mask	Usable IP Address Range	Broadcast Address
D01	192.168.50.0	255.255.255.192	192.168.50.1 - 192.168.50.62	192.168.50.63
D02	192.168.50.64	255.255.255.224	192.168.50.65 - 192.168.50.94	192.168.50.95
D03	192.168.50.96	255.255.255.240	192.168.50.97 - 192.168.50.110	192.168.50.111
D04	192.168.50.112	255.255.255.248	192.168.50.113 - 192.168.50.118	192.168.50.119

(2) (v) — **5 Marks**

1 mark for each:
A: Internet - Router - Firewall - IT switch link
B: Connecting Accounts, Sales and Administration switches to the IT switch
C: Connecting Proxy and the DNS servers to the IT switch
D: Connecting the computers to the switches in each department
E: Connecting switches with cables and naming correctly

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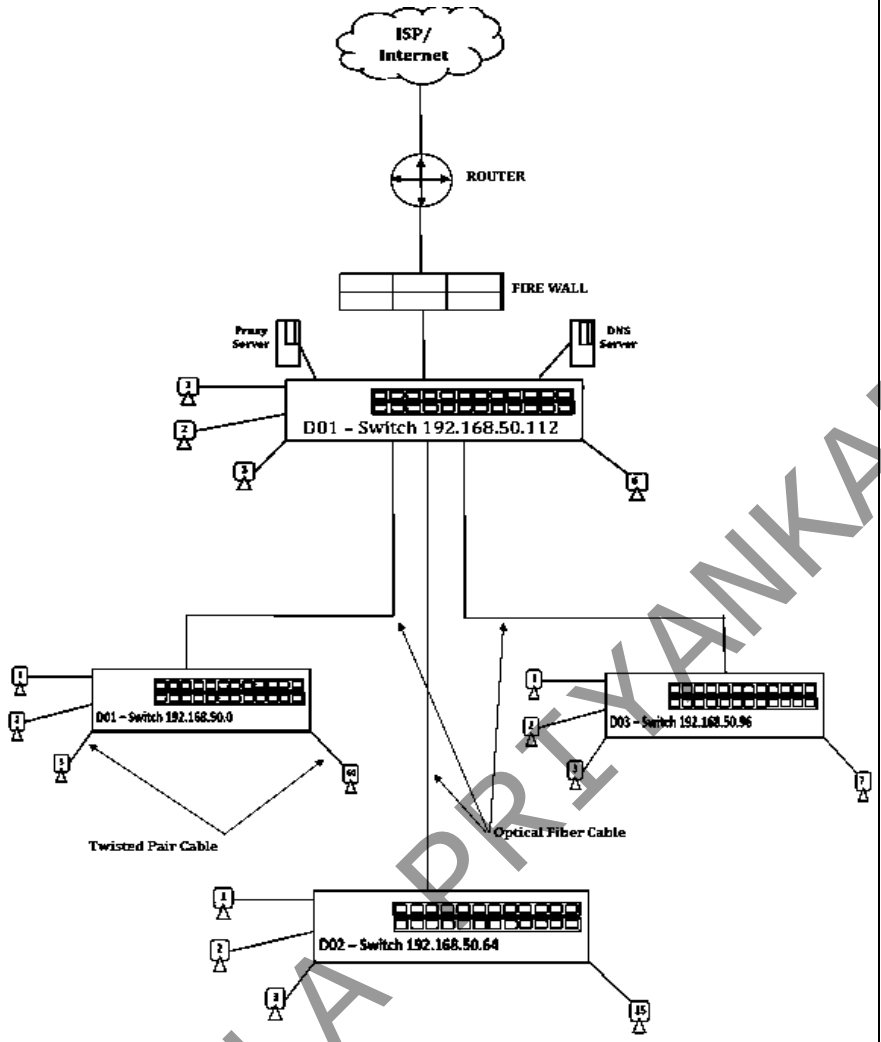

(2) (vi)

2 Marks

Any **two** from the following

	TCP	UDP
Connection	Connection-oriented protocol	Connection-less protocol
Speed	The speed for TCP is slower	The speed for UDP is higher
Error Detection	Yes	No
Data Packets	Data packets are arranged in the correct order	Data packets are independent of each other, and therefore does not follow a sequence.
Acknowledgement	Acknowledgement Segments	No Acknowledgement Segments
Handshake Protocol	Uses protocols such as: - SYN, ACK, SYN-ACK	No Handshake, and therefore connectionless protocol.
Reliability	Successful deliverance of data to destination router, and therefore reliable.	Deliverance of data to the destination router is not reliable.

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(3) (a)	4 Bits	**3 Marks**
(3) (b)(i)	110 0000 1101 0100 **or** 24788	**3 Marks**
(3) (b)(ii)	○ page is called in the program for the very first time ○ page was in physical memory before but has been taken off to make room for another page / the page has been swapped out ○ the process has finished execution	**2 Marks**
(3) (b)(iii)	○ The program size could be larger than the size of the physical memory ○ Effective memory management. ○ Simplicity in partitioning (non-contiguous memory allocation). ○ Allocating memory is simple and inexpensive. ○ Pages are simple to share. ○ No compaction is necessary. ○ no external fragmentation. ○ more efficient swapping.	**2 Marks**
(3) (b)(iv)	MMU – Memory Management Unit	**1 Mark**
(3) (c)(i)	503	**1 Mark**
(3) (c)(ii)	16 KB	**1 Mark**
(3) (c)(iii)	1 mark for each: A: Entry in 502 changes to 504 (or another free block number) B: Entry in 504 (or the free block number used in A) changes to -1	**2 Marks**

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Final Marks Distribution:

Part – I 1 x 30 = 30 Marks **Part – II A** 10 x 4 = 40 Marks **Part – IIB** 15 x 2 = 30 Marks

Total: 100 Marks

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