A/L ICT 2025 (Gr.12)

Marking Scheme

3rd Term– 2025 Examination

FWC

Field Work Center (FWC)

This document /scheme has been prepared for the use of marking examination paper.

Some changes and alternative answers would be made by the teachers.

PART – I

Question No	Answer No	Question No	Answer No	Question No	Answer No	Question No	Answer No
01	3	11	5	21	2	31	1
02	3	12	5	22	2	32	4
03	1	13	4	23	3	33	2
04	5	14	2	24	1	34	1
05	4	15	5	25	4	35	5
06	3	16	1	26	2	36	5
07	4	17	2	27	1	37	3
08	3	18	1	28	1	38	5
09	4	19	5	29	2	39	4
10	2	20	4	30	5	40	5

(40*1=40 marks)

PART - II(A)

01) i.

Aspect	Parallel Computing	Grid Computing
Structure	Operates within a single computer or tightly coupled system	Connects multiple geographically dispersed computers.
Resources	Shares resources (CPU, memory) within a single system.	Utilizes independent resources from multiple systems.
Processing	Tasks are split and executed simultaneously within the same environment.	Tasks are distributed to different computers across a network.
Data Sharing	Shared memory or message passing is used for communication between processes.	Data is stored and accessed via networked systems or local storage.
Purpose	Enhances performance by utilizing multiple processors for a single task.	Leverages distributed resources for large-scale computations.

(02 marks)

ii. Plagiarism is the representation of another person's language, thoughts, ideas, or expressions as one's own original work (01marks)

Solution- Citing, quoting, referencing (01 marks)

iii.

I. EDVAC
II. 1st processor/CPU
III. 1st programmer
IV. Punch card
V. Analytical Engine
VI. Blaise Pascal (6*0.5=3 marks)

(b). (I) $\overline{\overline{(A+B)}.(A+AB).C}$

$=\overline{\overline{A+B}}+\overline{(A+AB).C}$ (De morgon's law)

$=(A+B)+\overline{AC}$ (Double complement law)

$=A+B+\overline{AC}$ (De morgon's law)

$=A+B+\bar{A}+\bar{C}$ (complement law)

$=1+B+\bar{C}$ (Identity law)

=1 (02 marks)

(II) $(A+\bar{B})(\bar{A}+B)$

$= A.\bar{A}+AB+\bar{A}\bar{B}+B.\bar{B}$ (distributive law)

$= 1+AB+\bar{A}\bar{B}+1$ (identity law)

$= AB+\bar{A}\bar{B}$ (01 marks)

= XNOR Gate (01 marks)

02) (a)

i. 23 - 00010111_2
-45 -11010010_2 (01marks)

ii. 00010110_2 (01marks)

iii. 11101010_2 (02 marks)

iv. Check the MSB
If it is 0, the sign is positive-convert the number to decimal
If it is 1, the sign is negative
-Get binary number
-Invert bit values
- Add 1 to LSB
- Convert the number to Decimal (01marks)

v. More efficient Calculations
Possible to represent negative number
Subtraction are carried out as additions
A single Representation is used to represent a zero (01marks)

(b) AND - 00110110_2

XNOR-01111110_2 (02 marks)

(c) +25= +11001

Scientific method = $+1.1001 \times 2^4$

Power based value = $2^{8-1} -1 + 4 = 128-1 + 4 = 131$

0 10000011 10010000000000000000000 (02 marks)

03) (a)

1. Class C (192-223) (1 Marks)
2. $2^5 – 2 = 30$ (1 Marks)
3. 201.5.19.1—201.5.19.30 (1 Marks)
4. 201.5.19.31 (2 Marks)

(b)

1. Company employees do not like change and don't like the new system
   Employees should be trained, its lead to the wastage of time and money
   Errors may occur during conversion of data to the old system to new system
   (1 Marks)

2. Functional Requirements
   - Describe what the system should do.
   - Focus on specific features or tasks the system must perform.
   - Example: "The system must allow users to log in with a username and password."

   Non-Functional Requirements
   - Describe how the system should work.
   - Focus on qualities like performance, security, and usability.
   - Example: "The system should load a page within 2 seconds."

   (2 Marks)

3. Lack of Flexibility (1 Marks)

4. Unit test → Integration test → System Test → Acceptance test (1Marks)

04) a.

Yes (1 Marks)

Program in execution is called process. When a program executes by two or more times, that will create two or many processes. (1 Marks)

b.

Process ID (PID) Process State

CPU Registers Memory Management Information: (2 Marks)

c.

i. $2^5 = 32$ (2 Marks)

ii. 0-31 / 2^5 -1 (1 Marks)

iii. 5 bits (1 Marks)

d.

i. 2^{47} bits (1 Marks)

ii. 2^{-21} TB (1 Marks)

PART II (B)

01

i) $\overline{AB + (\overline{B + C})}$

$= \overline{AB} \cdot \overline{(\overline{B + C})}$ (De Morgan's law)

$= \overline{AB} \cdot (B + C)$ (Double complement law)

$= (\bar{A} + \bar{B}) \cdot (B + C)$ (De Morgan's law)

$= \bar{A}B + \bar{A}C + \bar{B}B + \bar{B}C$ (Distributive law)

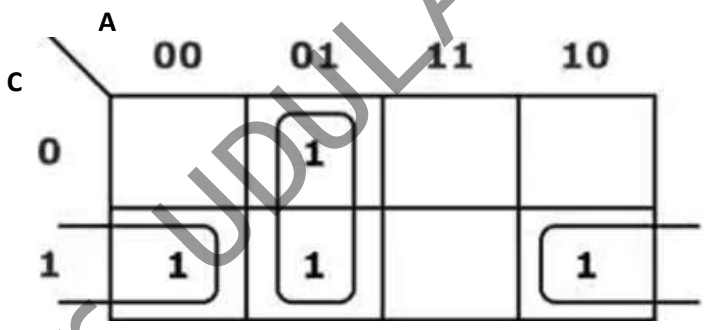
$= \bar{A}B + \bar{A}C + \bar{B}C$ (2 marks)

ii) $\bar{A}B + \bar{A}C + \bar{B}C$

$= \bar{A}BC + \bar{A}B\bar{C} + \cancel{\bar{A}BC} + \bar{A}\bar{B}C + \cancel{\bar{A}\bar{B}C} + A\bar{B}C$

$= \bar{A}BC + \bar{A}B\bar{C} + \bar{A}\bar{B}C + A\bar{B}C$ (2 marks)

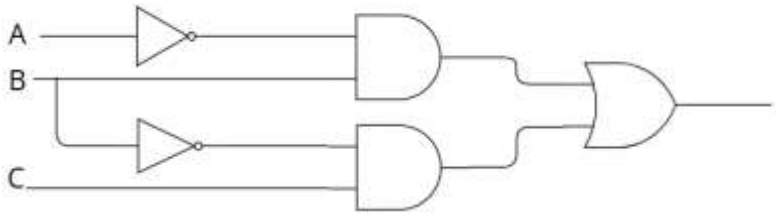
iii)



(2 marks)

$\bar{A}B + \bar{B}C$ (2 marks)

iv)



(2 marks)

02)

I. A system that accepts data as input, process data, and output information and stores them is considered as an information system. (1 marks)

II.

- It helps to select large number of students for different universities within very short period of time. Minimize the selection errors.
- Efficient selection method
- Cost efficient/minimize (2 marks)

III.

- Applicants must be able to create a user account in the web site of university grant commission.
- Messages must be able to send to the applicants' mobile phone and the e-mail after creating the correct user accounts.
- Application must be able to receive for the registration after logging to the user account.
- The results of GCE O/L and GCE A/L of applicants must be able to view separately from the system itself.
- A list that includes the subject stream followed by the applicants and all the courses which could be applied according to their qualifications must be able to display to the applicants.
- Applicants must be able to select the course order according to their favor and remove the rejected courses from the list.
- The selection order of courses must be able to change until the closing date of application. (2 marks)

IV

- Accuracy
- Efficiency
- Graphical user Interface should be provided to the system.
- It should be able to run on any operating system/ platform. (3 marks)

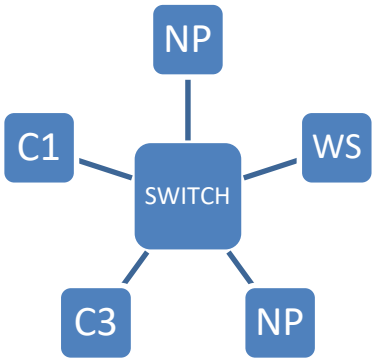
V.

- e- Banking via bank website
- Mobile banking by using mobile banking applications (2 marks)

03)

a)

1.



(1 Marks)

2.

TCP	UDP
connection-oriented	Connectionless
high reliability	No reliability
Checking Acknowledgment	No Acknowledgment
Ordered data delivery	No Ordered
Slow	Fast
Error control, Flow control	No Error control, Flow control

(2Marks)

3. Reduction of signal strength during transmission. Use an amplifier to reduce the attenuation in media. (2Marks)

b)

1. 255.255.255.224 (1 Marks)

2. 2^5-2 / 32-2=30 (1 Marks)

3.

SUBNET	NETWORK ADDRESS	FIRST USABLE IP	LAST USABLE IP	BROADCAST ADDRESS
DAP JAFFNA HQ	192.168.10.0	192.168.10.1	192.168.10.30	192.168.10.31
HUMAN RESOURCE	192.168.10.32	192.168.10.33	192.168.10.62	192.168.10.63
INFORMATION DEP	192.168.10.64	192.168.10.65	192.168.10.94	192.168.10.95
EXT AFFAIRS DIVISION	192.168.10.96	192.168.10.97	192.168.10.126	192.168.10.127
SALES DIVISION	192.168.10.128	192.168.10.129	192.168.10.158	192.168.10.159
	192.168.10.160	192.168.10.161	192.168.10.190	192.168.10.191
	192.168.10.192	192.168.10.193	192.168.10.222	192.168.10.223
	192.168.10.224	192.168.10.224	192.168.10.254	192.168.10.255

(3 Marks)