A/L ICT 2021 (Gr.12)

Marking Scheme

March – 2020 Examination
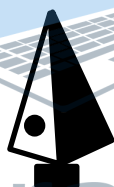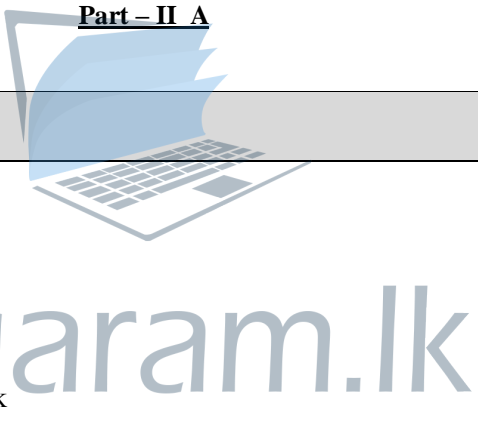
Field Work Center (FWC)

Part – I

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

Part – II A

Question No.		Marks
(1)(a)	(i) Long term scheduler (ii) Operating system (iii) Process control block (iv) Page table	2 marks [0.5x4]
(1)(b)	Contiguous allocation Indexed allocation Linked allocation	1.5 marks [0.5x3]
(1)(c)	Contiguous allocation	0.5 marks

(1) (d)(i)	2^{16}	**0.5 marks**
(1)(d)(ii)	$0 \rightarrow 2^{16} - 1$	**0.5 marks**
(1)(d)(iii)	Width of an address bus = 16 bits Max. no. of address spaces = 2^{16} Max. Capacity of memory = 2^{16} bytes = 64 KB	**3 marks [1 for each step]**
(1)(e)	A – Ready B – Waiting C – Terminated / Exit D – Interrupt	**2 marks [0.5 x 4]**
(2)(a)	**(i)** False **(ii)** False **(iii)** True **(iv)** False	**2 marks [0.5x4]**
(2)(b)	• Routing / Packet routing • Logical addressing / IP addressing	**2 marks [2x1]**
(2)(c)		**4 marks [2x2]**

(2)(d)		**2 marks** **[0.5x4]**
	(i) No error	
	(ii) Error	
	(iii) Error	
	(iv) Error	
(3)(a)	$19_{10} = 00010011_2$ $-13_{10} = 11110011_2$ $\phantom{-13_{10} =}\ 00000110_2$ Discard carry bit 1	**2 marks** **[0.5 for** **each point]**
(3)(b)(i)	 $A.(\bar{B} + C)$	**1.5 marks** **[map -1,** **expression** **– 0.5]**
(3)(b)(ii)		**1 marks**
(3)(b)(iii)	$ABC + A\bar{B}\bar{C} + A\bar{B}C$	**2 marks**
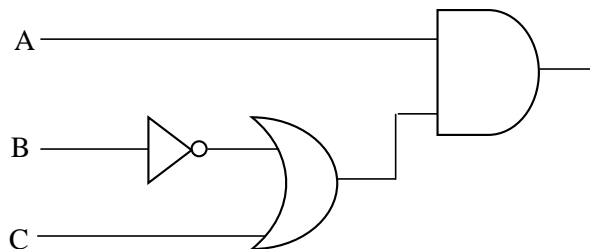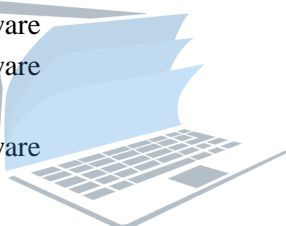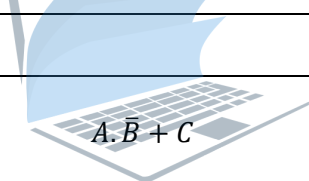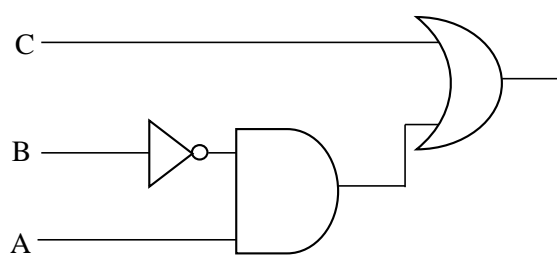
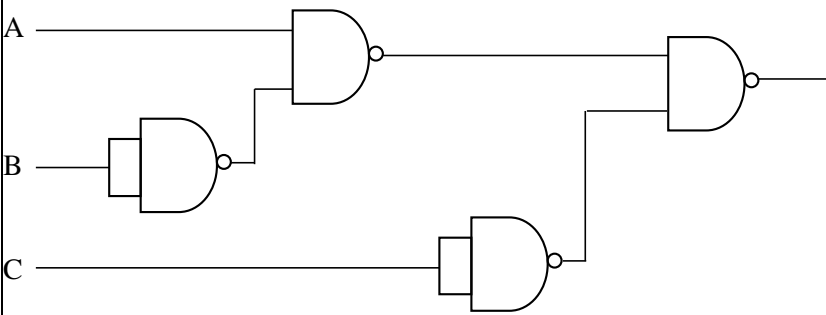|		
(3)(c)	① Power good ② CPU ③ POST ④ Boot loader ⑤ OS	**2.5 marks** **[0.5x5]**
(3)(d)	• Shared memory • Message passing	**1 marks** **[0.5x2]**
(4) (a)	**(i)** System software **(ii)** Application software **(iii)** Application software **(iv)** System software **(v)** Application software **(vi)** System software	**3 marks** **[0.5x6]**
(4) (b)	A – Application software / System software B – Application software / System software C – Operating system D – Hardware	**2 marks** **[0.5x4]**
(4) (c)	① Register ② Main memory ③ Hard disk ④ USB drive ⑤ Remote storage	**2.5 marks** **[0.5x5]**

(4) (d)		2.5 marks [0.5x5]
	Application layer	
	Presentation layer	
	Session layer	
	Transport layer	
	Network layer	
	Dalalink layer	
	Physical layer	

Part – II B

Question No.		
(1)(a)	$A.\bar{B} + C$	2 marks
(1)(b)		3 marks [0.5 for each column]

(1)(b)

A	B	C	$\bar{B}$	$A.\bar{B}$	$A\bar{B} + C$
0	0	0	1	0	0
0	0	1	1	0	1
0	1	0	0	0	0
0	1	1	0	0	1
1	0	0	1	1	1
1	0	1	1	1	1
1	1	0	0	0	0
1	1	1	0	0	1

(1)(c)

2 marks

(1)(d)		**3 marks**
(2)(a)(i)	A process is a program in execution.	**1 marks**
(2)(a)(ii)	• *Save the context of the process* that is currently running on the CPU. • *Load the state of the process to be continued* to the CPU from *PCB*. • *Transfer the control to the process to be continued*. • *Restore* the context of the process from PCB that was *previously running*.	**2 marks [0.5x4]** **Each point – 0.5 marks**
(2)(b)(i)	When an application requires more memory space than the maximum memory space available in the main memory of a computer is ready for execution, operating system uses virtual memory system. Or It gives larger memory than the physical memory.	**1 marks**
(2) (b)(ii)	No. of pages = 2^{20} No. of frames = 2^{14} No. of entries required by page table = 2^{20}	**6 marks [2x3]**
(3)(a)(i)	**TCP: -** A file to be transmitted in its *entirety without any errors*, therefore the error *detection and correction properties* of TCP are needed.	**1 marks**
(3)(a)(ii)	**UDP: -** When watching a movie, *delay is critical* and therefore there isn't any time to seek the retransmission of any errors.	**1 marks**
(3)(a)(iii)	**TCP: -** Web pages need to be delivered *without error* so that all content is properly formatted and presented. Therefore the *error detection and correction properties* of TCP are needed.	**1 marks**

(3)(b)

Department 1

Department 2

Department 3

Head office

Proxy server   *DHCP server*

Firewall
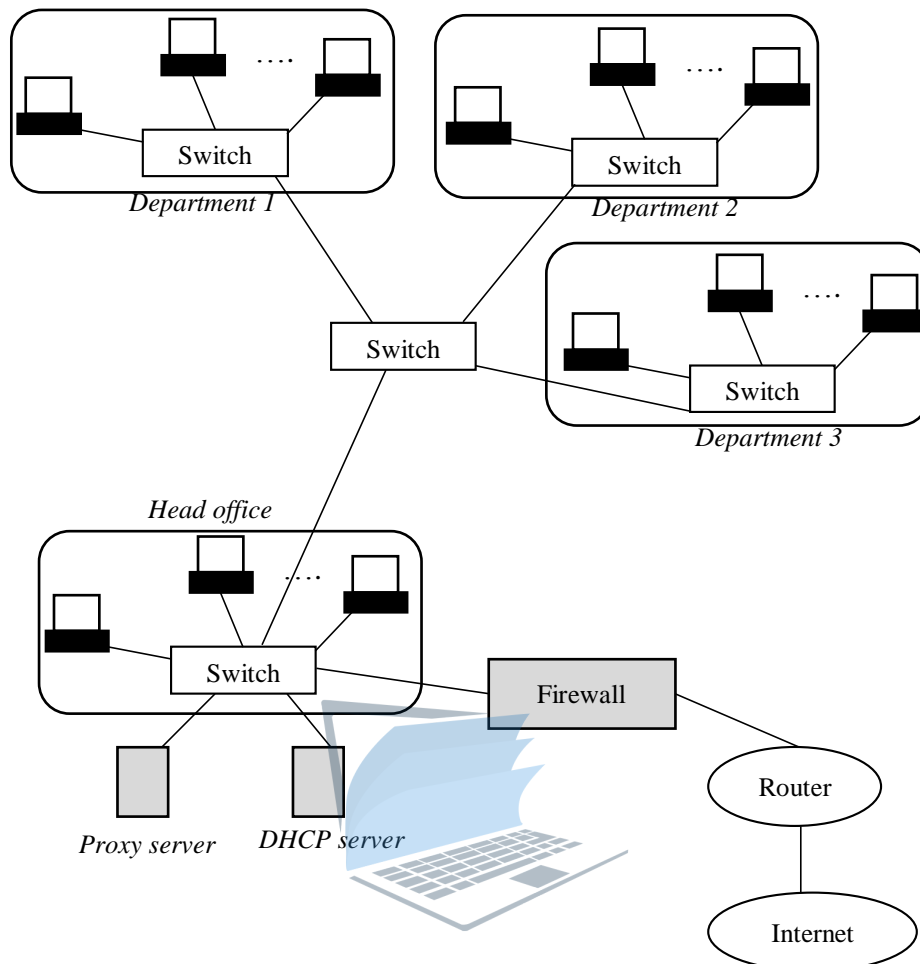
Router

Internet

10 marks

Each subnets – 4 marks [1x4]

Firewall, router, Internet – 1 marks for all

DHCP / proxy servers – 1 marks [0.5+0.5]

Table : IP address allocation – 4 marks [1x4 – each rows]

IP address allocation – if any suitable and alternative answers, give marks.

Subnet	Network address	Subnet mask	IP address range
Head office	*192.168.1.0*	*255.255.255.192*	*192.168.1.0-192.168.1.0.63* or *192.168.1.1-192.168.1.0.62*
Department 1	*192.168.1.0.64*	*255.255.255.192*	*192.168.1.64-192.168.1.0.127* or *192.168.1.65-192.168.1.0.126*
Department 2	*192.168.1.0.128*	*255.255.255.192*	*192.168.1.128-192.168.1.0.191* or *192.168.1.129-192.168.1.0.190*
Department 3	*192.168.1.0.192*	*255.255.255.192*	*192.168.1.0.192-192.168.1.0.255* or *192.168.1.193-192.168.1.0.254*

Final Marks Distribution:

Part – I 1 x 40 = 40 marks   **Part – IIA** 10 x 4 = 40 marks   **Part – IIB**   10 x 2 = 20 marks

Total: 100 marks

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