Serangoon Secondary Computing Sec 4E 2018 Preliminary Exams (Answers)

Q1)



Q2)

a)	128	64	32	16	8	4	2	1
	1	0	1	1	0	1	0	1

= **1**81₁₀

b) $F_{16} = 15_{10} = 1111_2$ $8_{16} = 8_{10} = 1000_2$

= 1111 1000

c)

Denary	Quotient	Remainder
250 ÷ 16	15	$10_{10} = A_{16}$
15 ÷ 16	0	15 ₁₀ = F ₁₆

= FA₁₆

Cause of error	Description (any one point)	Prevention (any one point)	Integrity of data (any one point)
Authentication	 process of verifying the identity of a user 	 password security tokens Two-factor authentication / OTP biometrics 	 someone other than the user can have access to personal data and perform unauthorised transactions without the user knowledge
Access control	 Permissions to control ability to view or make changes to the contents of folder or files 	 Set permissions to members only based on types of user / group of users Privacy settings Firewall Encryption 	 Data not meant for certain users to view / modify can be compromised accidentally
Privacy policy	 Rules and practices that govern how the data can be accessed 	 Implement a Data Protection Act Read and understand the privacy policy of the organisation providing the service 	 Unauthorised access can also occur indirectly due to the actions of third-party users or services.

Statement	Interpreter	Compiler
takes one statement at a time and executes it	\checkmark	
generate an error report at the end of translation of the whole program		~
stops the translation process as soon as the first error is encountered	\checkmark	
slow speed of execution of program loops	\checkmark	
translates the entire program in one go		~

Q5)

A <u>bus</u> is used to transfer bits of data between the different components found on the <u>motherboard</u> One such component is the <u>ROM</u> which stores the instructions to the start-up the computer.

Q6)

a) Device:

- Network Interface Card (NIC)

Function:

- Provides the hardware interface to ..
- enable the transfer of data between a device and a network
- b) Device:
 - Bridge / Switch

Function

- Device that constructs a single network by connecting two similar networks together
- Has more intelligence, send packets only to intended recipients thus avoiding less data congestion (data travelling at any point in the network
- c) Device:
 - Router / Getway

Function:

- Device that forwards paclets between separate networks
- Chose the best route to transfer to destination network
- Uses IP address to transfer data

- a) Any three from
 - IP address Used by Internet Protocol to
 - \circ $\;$ identify the network and host address of the devices
 - Logical address (may change / not fixed)
 - IPv4 address take the form of a 4 bytes or group (IPv4 32-bits)
 - MAC address Media Access Control to
 - o Identify the computer in the local network
 - Physical address (fixed / unique for every device)
 - Made up of 6 bytes or group (48-bits)
- b) Parity bit is used for error detection in data transfer
- c) Any two from
 - The receiver detects an error in the data packet because
 - for odd parity there should odd number 1 bits
 - instead there are even number (four) of 1 bits at the receiver
- d) Any one from
 - Parity bit can only detect single bit or odd number of bit errors.
 - It does not know which bit has been corrupted, so
 - It cannot do error correction

Q7)

Q8)

Inputs :

- List of shops with
- corresponding phone model price and discount rate

Outputs:

- Shop name with
- the price of the phone model that cost the least

Processes required:

- Store the data in the array / list
- Initialize the lowest price variable
- Compute the price after applying discount for each shop
- Compare the price with the lowest price
- Update lowest price if it is lower

Q9)

- a) Any one from:
 - Error 1 : Line 1
 - Correction : Small = 999
 - Error 2 : Line 5
 - Correction 2 : IF Num < Small THEN Small = Num
 - Error 3 : Line 8
 - Correction 3 : UNTIL Counter = 30 or UNTIL Counter > = 30 or UNTIL Counter > 9
 - Error 4 : Line 7
 - Correction 4 : PRINT Small should come after the end of the repeat loop
 - or line 8 should come before line 7

b)

- i. Any two from:
 - the input Num has to be stored in an array or list because
 - all the input numbers is needed
 - for later use in the program
- ii. NumberList = NumberList + [Num] or any similar notation

Q10)

a)



b)

			Working Space	
Α	Т	S		Y
0	0	0		0
0	0	1		0
0	1	0		1
0	1	1		0
1	0	0		1
1	0	1		1
1	1	0		1
1	1	1		0

6

Engine	Count	Number	Size	Average	Output
0	0	0	1.8		
1.8	1	1	2.0		
3.8	2	2	1.0		
4.8		3	1.3		
6.1		4	1.0		
7.1		5	2.5		
9.6	3	6	2.0		
11.6	4	7	1.3		
12.9		8	1.8		
14.7	5	9	1.3		
16.0		10	-1		
				1.6	
					1.6, 5

Q11)

Q12)

Marking points

- correct loop
- correct inputs
- check for type and calculate itemcost
- action taken if type NOT 1, 2 or 3
- calculate totalcost
- calculate the average totalcost
- both outputs in the correct place

Sample algorithm:

total cost = 0

for x = 1 to 1000

input type, partcost

(

if type = 1 then itemcost = partcost * 1.5 if type = 2 then itemcost = partcost * 2.5

if type = 3 then itemcost = partcost * 5.0

else print error

totalcost = totalcost + itemcost

print itemcost @

next x

average = totalcost/1000

print average @