Question	Answer	Marks
1(a)	One mark each: B1 – Currency B2 – Percentage	2
	Not accepted: Accounting, Numbers	
1(b)	PMT()	1
1(c)	IPMT()	1
1(d)	One mark each: =ROUND(B4,0) -\$1,012 =CEILING(B8,-10) -\$680 =SUM(B8:B247) -\$200,000 =LARGE(C8:C247,2) -\$3.36 Note: Negative sign (-) and dollar sign (\$) must be written.	4
1(e)	One mark for function name, one mark for correct parameters =COUNTIF(C8:C247, "<-100")	2
1(f)	FV()	1
	Sub Total	11

2021 Computing Prelim Paper 1 – Marking Scheme

Question	Answer	Marks
2(a)	One mark for the correct answer and one mark for showing relevant working:	2
	Sum of place values method: $11001001_2 = 2^7 + 2^6 + 2^3 + 2^0$ $= 201_{10}$	

2(b)	One mark for the correct answer and one mark for showing relevant working:							2	
	Cum of place volues mathed								
		2012CE V	aiues i 25	24 method:	2 3	2 2	2 1	20	
	128	<u> </u>	32	16	8	4	2	1	
	1	0	0	1	0	1	0	0	
	∴ 148 10 =	= 1001	01002	2			-		
	_								
	OR								
	Division	by 2 m	ethod	<u> </u>	- 1				
	Denary	/ Quo	tient	Remain	der				
	148	7	4	0					
	14	3	67	0					
	37	1	8	1					
	18		9 1	0					
	9		+ 2	0					
	2		<u>~</u> 1	0					
	1		י ר	1					
	∴ 148 ₁₀ :	= 1001	01002))					
		- 1001	01002	-					
2(c)	A16 = 10	0102							1
	E16 = 1110 ₂								
	∴ AE ₁₆ =	: 1010	1110 ₂						
0(-1)								0	
2(d)	Any two from:							2	
	Hexadecimal numbers are more compact than binary								
	numbers								
	(Fewer number of digits used to represent a value in								
	hexadecimal as compared to binary)								
			-						
	It is easi	ier to io	dentify	/ values/	spot er	rors in l	nexadeo	cimal	
	numbers	s as co	mpare	d to binar	y numb	pers.			
			n vort	hatwaan	havada	aimal ni	mhoro	and	
	hinary n	y lo co	nvent	uired	nexade	cimai nu	impers	anu	
	Dinary In	umbera	ытеч	uneu.					
2(e)(i)	A byte is	a unit	of dat	a (or men	norv) th	at is ma	de up o	f eiaht	1
_(*)(*)	bits.		J. 001						•
2(e)(ii)	32KB = 3	32 x 10) ³ x 8 k	= 2560	00 b				1
2(e)(iii)	e)(iii) $4GiB = 4 \times (1024)^4 B = 4 294 967 296 B$							1	
								Out Tatal	10
								SUD I OTAL	10

Question	Answer	Marks
3(a)	One mark for each part: <u>Weak authentication methods:</u> Example: Customers are allowed to use short passwords/ passwords which could be guessed by others, e.g. name, date of birth. OR Internet banking login page that allows multiple attempts to login by malicious user / does not differentiate between human and robot user. Measure: Implement strong password policies (e.g. minimum password length, use of special characters) / use two-factor authentication such as security tokens, SMS one-time pin (OTP) or biometrics OR Limit the number of incorrect attempts before the account will be locked / ask security questions to verify that the user is not a robot.	2
3(b)	One mark for each part: Poor access controls: Example: Bank employees who are unauthorised to access customer's data may be able to view or change their account information without permission. OR Internet banking page showing too much unnecessary information after customer has logged in, e.g. full credit card number, date of birth, address (This is risky when third-party is able to view the customer's screen, e.g. spyware on customer's PC, accessing through public wifi, etc.) OR Customers are allowed to perform large transactions or change critical information (e.g. phone number, address) without further verification. (This is risky if the account is accidentally or intentionally accessed by a third-party.) Measure: Implement stronger access controls so that bank employees are only allowed to access data that is necessary for them to carry out their assigned duties / encrypt customer's data and only allow authorised user to decrypt them. OR Hide unnecessary critical information on the home page after user has logged in and perform more verification checks if the user wants to view them. OR	2

	Perform more verification checks if the user wants to make large transactions or change critical information, e.g. answer security questions, submit proof of identity.	
3(c)	One mark for each part: Privacy policy: Example: The bank may share certain customer data such as account balances and spending habits with third parties without the permission of the customers. OR Certain customer data may be revealed to the public, e.g. identity numbers on lucky draw lists, phone numbers and email addresses on surveys etc. Measure: State clearly in the bank's privacy policy about how will the customer's data be used, shared or stored/ inform the user about the privacy policy whenever there is a change or when the user first signed up for an account. OR Hide critical customer data such as identity numbers, phone numbers and email addresses when sharing data with third parties or the public.	2
	Sub Total	6

Question	Answer	Marks
4(a)	One mark for similarity, one mark for difference Similarity: Both redirects the user to a fake website that appears to be legitimate. OR Both steals personal data such as login credentials or credit card details. Difference: In phishing, users are led to the fake website directly through links in an email or SMS message, whereas in pharming, users are led to the fake website indirectly when their communication with the real website have been redirected without their knowledge. OR Phishing rely on email or SMS messages to carry out the attack, whereas pharming does not rely on those.	2
4(b)	The URL of the webpage should begin with "https://" OR A padlock icon is shown next to its address on a web browser.	1

4(c)	 Any one from the following: Look out for grammatical errors in the website generic greetings instead of your name or account ID Regularly update web browsers and software Make sure that two-factor authentication is enabled for logins and performing important transactions Contact the bank to verify whether the website, email or SMS is legitimate. 	1
	Sub Total	4

Question	Answer	Marks
5(a)	 One mark for each correct point Positive: Online communication has enabled diverse cultures to interact and share ideas with each other. OR Instant messaging services allow people and businesses to communicate with each other at any time, regardless of location. OR Online communication tools allow us to reconnect with old friends or family members or find new friends. OR Social networking services have allowed users to remain connected with friends, family and colleagues even over long distances. Negative: Social networking is used to spread rumours and misinformation. OR Notifications from social media and instant messaging distracts us from important tasks. OR When internet connection is disrupted, online communication is cut off which disrupt our lives. 	2
5(b)	Any 2 from: The use of self-driving vehicles and automated trains cuts the costs of public transportation. OR Ride-hailing apps allow taxi drivers earn additional income by picking up more passengers. OR Statistics about passenger travel helps bus and train companies manage their schedules better to cut costs, e.g. lower frequency during off-peak hours.	2

5(c)	For critical life-saving medications, should the government continue to protect the interests of drug manufacturers and allow them to set their own pricing, or force them to sell at a regulated price and share their patents with others? OR Should robots replace humans in providing healthcare such as nursing services and palliative care?	2
	Sub Total	6

Question	Answer				
6	One mark for each word	3			
	Control unit				
	Address bus				
	Processor				
	Sub Tota	al 3			

Question	Answer					Marks	
7(a)	One mark for each correct logic gate: X = [(B AND C) NOR A] OR (NOT B NAND A)					5	
7(b)	One r	mark	for ev	ery 2 correct outputs		-	4
		Input	:	Working space	Output		
	Α	В	С		Х		
	0	0	0		1		
	0	0	1		1		
	0	1	0		1		
	0	1	1		1		
	1	0	0		0		
	1	0	1		0		
	1	1	0		1		
	1	1	1		1		
					S	Sub Total	9

Question	Answer	Marks
8(a)	One mark for each point:	2
	LAN is small, usually in the same building.	
	WAN is large-scale, typically across multiple geographical locations	



Question				Answer			Marks	
9(a)	One mark for each column filled correctly.							
	list_a	list_b	Х	count	check	OUTPUT		
	[]	[]	1					
		[1]	2	1				
	[2]		3	2	1			
				1				
	[2,3]		4	3	1			
				2	0			
		[1,4]	5	4	1			
				3	2			
				2	1			
				1				
	[2,3,5]		6	5	1			
				4	2			
				3	0			
		[1,4,6]	0					
						[2,3,5]		
						[1,4,6]		

9(b)	One mark for each point:	
	This algorithm takes in a few positive integers as input followed by a zero.	
	The algorithm then sorts these positive integers and outputs a list containing prime numbers and a list containing composite (non-prime) numbers.	
	Sub Total	8

Question	Answer	Marks	
10	One mark for correct location One mark for type of error One mark for matching correction		
	<pre>Error 1: for i in range (100) Type of error: syntax error Correction: for i in range (100): Error 2: if number[-1]=="0" and number[-1]=="5": Type of error: logic error</pre>		
	<pre>Correction: if number[-1]=="0" or number[-1]=="5": Error 3: total = total + number Type of error: run-time error Correction: total = total + int(number)</pre>		
	Sub Total	9	

Question	Answer	
11	 One mark for each point: initialisation of variables and arrays with appropriate names iteration for input of 20 contestants input of each contestant's name & score with suitable prompt store the names and scores in respective arrays iteration through the array after end of inputs comparing each score with the highest score initialise and updating the highest score output of winner's name and score 	8
	Sub Total	8