Computer Systems – Higher Checklist

Topic	Computer Systems	Tick
Data representation	Describe and exemplify the use of binary to represent positive and negative integers using two's complement, including the range of numbers that can be represented using a fixed number of bits.	
	Conversion of two's complement numbers from; • binary to denary • denary to binary	
	Describe and exemplify floating-point representation of positive and negative real numbers, using the terms mantissa and exponent.	
	Describe the relationship between the number of bits assigned to the mantissa/exponent, and the range and precision of floating-point numbers.	
	Describe Unicode used to represent characters and its advantage over extended ASCII code (8-bit) in terms of numbers of characters.	
	Describe the relative advantages and disadvantages of bit-mapped graphics versus vector graphics.	
Computer structure	Describe the concept of the fetch-execute cycle.	
	Describe the factors affecting computer system performance: • number of processors (cores) • width of data bus • cache memory • clock speed	
Environmental impact	Describe the environmental impact of intelligent systems: • heating systems • traffic control • car management systems	
Security risks and precautions	Describe and identify the implications for individuals and businesses of the Computer Misuse Act 1990: • unauthorised access to computer material • unauthorised access with intent to commit a further offence • unauthorised modification of programs or data on a computer	

	Describe and identify the security risks of:
	• tracking cookies
	• DOS (Denial of Service) attacks:
	  ○ symptoms
	  ▪ slow performance
	  ▪ inability to access
	  ○ effects
	  ▪ disruption to users and businesses
	  ○ costs
	  ▪ lost revenue
	  ▪ labour in rectifying fault
	  ○ type of fault
	  ▪ bandwidth consumption
	  ▪ resource starvation
	  ▪ Domain Name Service (DNS)
	  ○ reasons
	  ▪ financial
	  ▪ political
	  ▪ personal	

	Describe how encryption is used to secure transmission of data: • use of public and private keys • digital certificates • digital signatures	