Computer science paper 1 mock

1. I) a layer is a part of the complex networking process split into simplified segments

ii) Layers are self-contained meaning that they can be changed and modified without effecting the rest of the process

1. I) File Transfer Protocol should be used. This protocol is used to send computer files between computers.

ii) Hypertext transfer protocol secure (HTTPS) should be used to connect to online banking. HTTPS provides a secure and encrypted way of sending and retrieving HTML files.

1. A) An embedded system is a device with a specific function within a larger device/system

b) Washing machine, dishwasher and home security system

1. A) Computer 1 has more cores than computer 2 (4 vs 2)

b) RAM, Registers

c) It provides fast storage that can be used to store frequently used data within the CPU. Larger cache means more data stored however it will be slower to fetch the data.

d) Program counter passes its value to the memory address register

Results from the ALU (arithmetic logic unit) are stored in the ACC (accumulator)

Data from the MDR (memory data register) is stored temporarily in the cache.

1. a) Hard disk(magnetic), CD-RW (optical), USB memory stick (solid-state)

b) Cost, capacity, durability, portability

1. a) i) The ROM in a general-purpose computer is used to hold instructions to boot the computer. It stores applications like the BIOS (basic input output system)

ii) The RAM in a general-purpose computer is to hold applications that are currently being used by the operating system. It is also used by the CPU to store data and instructions.

b) RAM is volatile, ROM is non-volatile

1. i) Domain name server

ii)

2 – E

4 – D

5 – A

9 – B

10 – C

1. a) Staff should be trained to recognise fake emails. This could help them to spot phishing emails and they will not release personal information like passwords or patient records. The staff should also be trained to be careful when clicking links on emails as they could download malware onto the computer, endangering the system. The surgery should also make backups of all files frequently. This is important to protect against data loss or corruption, and malware like ransomware. The surgery should use penetration testing to make sure the system is secure. Penetration testing is attempting to hack your own system to look for flaws within it.

b) An employee may access a dangerous website. The surgery could install a firewall to secure the network. A firewall is a software-based security system which only allows certain packets to and from a computer/network. This may block unwanted data entering or leaving the network.

The receptionist may accidentally install malware on their computer. To stop the malware spreading to the personal information, the surgery could use a virtual network to increase the security of the network. A virtual network is a network in which its logical structure is applied independently from its physical structure. This allows different ‘networks’ on the same physical networks. Therefore, the receptionist will have access to a different network to where the patients’ sensitive data are stored.

One of the doctors may send an email to another doctor containing personal information. This data could be intercepted. To prevent this, data travelling across the network should be encrypted, specifically if it is using Wi-Fi.

1. A) Antivirus – security

Defragmenter – disk organisation

File transfer – disk organisation

Firewall – security

b) Allocate space for applications in the RAM

Maintain the computer system

c) Open source software is software which is not copyright protected and can be modified and distributed by anybody. Users have access to the source code, and it is usually free.

1. Method: incremental backup

Justification: In an incremental backup, only the files that have been changed since the previous backup have been added to the backup. This makes the speed of the backup quicker than a full backup. For this reason, it also doesn’t take as much storage as a full backup. Although, the time for restoring a system from an incremental backup will take longer.

ii) Utility program: Defragmentation utility

description of use: As data on a hard disk is repeatedly written to, and data is overwritten, the disk becomes fragmented. Over time, this leads to the speed of the hard disk decreasing. Defragmentation software is used to reorganise data to produce faster speeds of the hard disk.

1. I) A USB memory stick is an example of a solid-state device.

ii) It is secondary memory

iii) The portability of a solid-state device is better than that of an optical storage device. This is because solid state devices are usually smaller than optical storage devices. They also do not need to be protected as much. Optical devices usually use cases when being moved to prevent damage. Although, both of the options are relatively portable, and can both be taken from one place to another fairly easily. This will be important for Kerry as she may need to move the storage device.

The robustness of a solid-state device is massively better than an optical storage device. Optical devices are very fragile, as they contain a surface consisting of lands and pits which have to be read for the device to work. If these lands and pits are scratched there is a possibility of the data becoming unreadable and corrupted. Solid-state devices are much more robust, for example a USB stick is very durable. Solid state devices are often used in situations where durable storage is needed, for example in an action camera (GoPro). I doubt Kerry will be using a GoPro, but she may need to storage device again in the future for other purposes

The capacity of an optical drive is usually tiny compared to solid state devices. The average solid-state device can contain gigabytes of data, whereas optical devices are usually can contain only megabytes of data. The only exception of this is Blu-Ray optical devices. If Kerry needs to transfer a lot of files, she should definitely use a solid-state drive.

The cost of optical devices is also very small compared to solid state devices. Solid state drives can cost a lot of money but not as much when the capacity is small. As optical devices tend to be slower and have less capacity, they are often much cheaper. If Kerry wants the cheap option, she should choose the optical storage.

It is hard to say whether Kerry should use an optical devices or a solid-state device. If she needs to transfer large amounts of data or travel long distances, I recommend she uses a solid-state device. If she isn’t going very far and doesn’t need a lot of storage, I would recommend an optical device as it is generally cheaper.

iv) 5GB x 1000 = 5000MB

answer = 5000MB