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INFORMATION TECHNOLOGY – GRADE 12

PRELIM 2018 THEORY – MARKING GUIDELINE

3 hours
180 marks

QUESTION 1

- 1.1 Virtual memory (VM) is a feature of the OS that simulates additional main memory such as RAM. ✓ Virtual memory by utilizing the hard disc drive (HDD) as temporary storage. ✓
- 1.2 The amount of data ✓ that can be transmitted through a network within a given time ✓, usually measured in bits per second.
OR: the range of frequencies ✓ within a particular band ✓ that is used for transmitting a particular signal
- 1.3 Transfer (data) to a less frequently used storage medium ✓ such as removeable HDD or cloud storage.. ✓
- 1.4 A database management system (NO marks for expanding the acronym!) is software that creates and manages databases ✓ and provides means to create, read, update, delete and manage the data. ✓ (at least three of these)
- 1.5 Software as a service (SaaS) is a model for the distribution of software where customers access software over the Internet ✓ - the service is paid for on a subscription basis. ✓

[10]

QUESTION 2

Column A	Column B
2.1 Attribute	D
2.2 SATA	M
2.3 Interrupt	A
2.4 BotNet	G
2.5 POP3	B
2.6 File compression	K
2.7 Data redundancy	N
2.8 Network backbone	I
2.9 SQL Injection	H
2.10 Gateway	F

10 x ✓ = [10]

QUESTION 3

3.1

3.1.1 Primary ✓ (1)

3.1.2 DDR SDRAM allows for two sets of data to be written per clock cycle OR Data transferred twice ✓ per clock tick. ✓ (2)

3.1.3 More RAM slots ✓ Motherboard supports DDR4. ✓ (2)

3.2

3.2.1 Select motherboard; give justifiable reason. Possible example: Motherboard in Figure 2 will probably benefit most from an additional graphics card as it is aimed at gaming use, better to have an external card for this with lots of RAM, allow CPU to get on with other tasks. ONE valid option. (2)

3.2.2 Since there is no RAM on the graphics card, system RAM has to be used. (1)

3.3 The PCI interface used parallel ✓ connections whereas the PCI-express bus is a two-way, serial connection along two pairs of point-to-point data lanes ✓. (2)

3.4

3.4.1 Overclocking is the increasing of the clock multiplication factor ✓ for a component by the user to make the component run faster than the manufacturers specifications. ✓ (2)

3.4.2 Overclocking can lead to components becoming unstable ✓ or failing if the factor applied is too large whereas clock multiplication on a motherboard done by the manufacturer does not lead to unnecessary overheating ✓
Accept other clear, valid differences (2)

3.5

3.5.1 The chipset has to manage the movement of data between the processor (CPU), ✓ memory (RAM) and peripheral devices.. ✓ (2)

3.5.2 Because they use different CPUs; ✓ chipsets are designed to work with a specific family of processors. ✓ (2)

3.6

3.6.1 A data storage technology which combines multiple physical drives ✓ into one logical drive as a form of data redundancy ✓; also accept to improve performance. (2)

3.6.2 RAID level 0 ✓ uses disk mirroring ✓ so there would need to be an additional drive for each existing drive ✓ so that each can be mirrored. or RAID level 5 – there are enough drives to have parity (3)

3.6.3 RAID 5 -Two additional drives. RAID) – one additional drive ✓ (1)

3.6.4 Faster access ✓ – more robust (no moving parts) ✓ – smaller footprint (2)

QUESTION 4

4.1

4.1.1 Can get access to the source files✓. (1)

4.1.2 need technical skills

Less chance of tech support✓. (1)

4.1.3 a) Running several tasks simultaneously ✓.by switching the CPU between multiple tasks.✓

b) Scheduler : tasks waiting for CPU will be placed on✓ READY ✓

If waiting for IO or other resources✓ – WAITING✓

Active – RUNNING – may be interrupted by scheduler if time up

Completed – TERMINATED

ANY TWO

4.1.4 Proprietary - can expect updates✓, support✓
Freeware - not suitable -limited features (3)

4.2

4.2.1 The cloud refers to the Internet✓. (1)

4.2.2 Faster✓ – since more CPUs✓ OR slower – remote connection ✓. (2)

4.2.3 They would be more vulnerable to attacks by hackers✓; they would have limited control over the mining of their currency as the cloud provider would control that✓; the server could go down and they would have downtime etc.
Any two ✓✓. (2)

4.2.4 Use resources of one powerful server to create many virtual servers ✓by allocating resources to virtual servers via use of hypervisor. ✓ (2)

QUESTION 5

5.1

- 5.1.1 Any three ✓✓✓ valid advantages such as:
Can add Wi-Fi capability via Wi-Fi access point
A problem with one node won't affect the other nodes
Easy to extend
A common topology, easy to find equipment
etc. (3)
- 5.1.2 Switch ✓
NIC ✓ (2)

5.2

- 5.2.1 A set of rules ✓ for transmission of data across a network ✓ (2)
- 5.2.2 a) TCP – transport protocol responsible for delivering complete messages ✓ – includes error checking ✓ (2)
- b) IP every device attached to the internet requires an IP address ✓ to ensure delivery of message/response to correct address ✓ (2)
- 5.2.3 HTTPS ✓

5.3

- 5.3.1 Fibre optic ✓
Twisted pair ✓
Accept coaxial although not used much anymore (2)
- 5.3.2 Any two valid factors such as:
Bandwidth - The amount of data that can be carried in a given time period/data transfer rate
Attenuation - The loss of signal strength
Interference - EMI/ Signal interference that can corrupt data
factor ✓ explanation ✓; factor ✓ explanation ✓ (4)
- 5.3.3 Router ✓ - provides connectivity to the internet links ✓ to your fibre or ADSL line/ path selection ✓
Other acceptable facts such the following to also get credit:
Device used to connect different networks – internet is different from the LAN
Can determine the best path for data packets
3G coms would not be sufficient ✓ (4)

5.4

5.4.1 *Any two advantages such as:* ✓✓

Can connect mobile devices to network

Provides some degree of portability

Can extend the network beyond the limits of cable connectivity (2)

5.4.2 *Any two such as:*

Wi-Fi (Radio Waves)- transferring data over short distances

Bluetooth (Radio Waves) - wireless communication over short distances

Infrared - uses infrared light to carry data between devices

GPS - uses satellite communication

name✓ describe✓ name✓ describe✓ (4)

5.5 Download ✓ IT may take a while to download but once saved on your device you will be able to view the video without interruptions✓

Streaming with low connectivity will lead to poor viewing with intermittent delays/much buffering (2)

5.6

5.6.1 Will provide users with a more personalized web experience.✓ Each user will have a unique Internet profile based on the user's browser history✓.

OR

The search data returned will be influenced by the user's profile. (2)

5.6.2 Improves search accuracy by understanding the searchers intent and context to generate more relevant results✓. Will look at the search query and related aspects such as the location✓ OR previous search requests (2)

5.7

5.7.1 cookie – small text file✓ stored in browser storing info on visit to website✓ (2)

5.7.2 Keeps a history of visits✓ to the website✓ and activity /preferences on the website (2)

5.7.3 Cookies may be vulnerable✓ to spyware / viruses✓ (2)

5.8

5.8.1 Yes✓ BitTorrenting involves accessing files using peer-to-peer protocol. The file transfer load is shared between different PC so is quicker, ✓

OR:

No✓ file searches and transfers from your computer to others can cause bottlenecks✓

Accept any other valid justifications (2)

5.8.2 *Any three valid benefits of BitTorrent such as:* ✓✓✓

Allows many users to download popular files quickly

Cost to the host is reduced

Some equality in sharing is forced

Offers an effective use of available download bandwidth

BitTorrent clients are free

etc. (4)

5.8.3 *Any two valid disadvantages of BitTorrent such as:* ✓✓

Each peers bandwidth is used

You may be party to illegal downloads

etc.

(4)

5.9

5.9.1 Provides a secure connection to a server or website ✓ – connection is made via the internet. ✓ (2)

QUESTION 6

6.1 *Any two such as:* ✓✓

Follow a reputable person or organisation that tweets regularly about technology.

Use RSS feeds to combine news items about technology.

Use pinning and bookmarking tools to remember interesting articles or websites.

Download podcasts on technology trends that you can listen to.

Use YouTube videos that showcase latest products and trends in technology.

Stumble Upon and Ted Talks have many relevant topics.

(2)

6.2 *Any advantage ✓ and any disadvantage ✓ such as:*

Advantages:

By updating a piece of software, you may speed up your computers performance.

By updating a piece of software to your computer you could run bug fixes

By downloading software, you may get some improvements to features that you already have on your computer

Your company will look more up to date if they have the latest software

By downloading new software, you may be able to use peripheral devices on your computer which you couldn't have used before

You can download software which will give your computer more security

Disadvantages:

You may have to pay money to update pieces of software

You may need to upgrade hardware to meet the requirements of new software

Software may take a long time to download and install

You may need to be trained on how to use certain types of software

You may download software that is not reliable

When you are downloading software, you don't know if it actually works or if it will actually do the job you want it to

By downloading software, you may be putting bugs onto your computer

You may need to spend time researching about companies that you want to download

software from. This is because you don't know what you are downloading, and you don't know if the company is trusted or not

(2)

6.3

6.3.1 *Any two such as:* ✓✓

Loss of revenue and potential "down-time"

Damaged reputation if knowledge of cybercrimes committed against them becomes public

(2)

6.3.2 *Any two such as:* ✓✓

Install a good firewall

Install a good anti-malware software and keep software up-to-date

Backup your data

Encrypt sensitive data such as passwords

Secure your password

Avoid scams

Log off from websites once you have completed your business

Ensure maximum privacy on your social media setting

Use secure networks

Prevent identity theft

etc.

(2)

6.4

6.4.1 *Any advantage*✓ *such as:*

The advantage that comes with social sharing is the ability for your content, offers and posts to reach a wider audience. If these individuals like what they've read, they may go onto read more blogs, convert for offers, etc.

Social sharing is very much like word-of-mouth advertising. When someone shares your content, they're acting as a type of brand evangelist. While it's not guaranteed that they're a loyal customer to your brand, they are someone who loves your content so much that they will happily promote it on your behalf for free.

Social sharing goes far beyond just exposure. It can also inspire lead growth and help with the overall success of your business.

(1)

6.4.2 *Any TWO valid considerations*✓ *such as:*

Can anyone use the information I am sharing to pretend to be me?

Is what I am sharing something that I might not be proud of in the future? Would I be proud of it or happy if my parents, family etc saw it?

Who else is impacted by what I am sharing? Am I possibly embarrassing, slandering or bullying someone with what I post.

etc.

(2)

6.4.3 Psychological manipulation of people into performing actions or divulging confidential information. ✓ A type of confidence trick for the purpose of information gathering, fraud, or system access, it differs from a traditional "con" in that it is often one of many steps in a more complex fraud scheme.

The most dangerous aspect of this is how attackers manipulate victims with offers or threats, fooling otherwise unsuspecting users or employees into handing over confidential or sensitive data. ✓ *Any feasible reason for danger*

(2)

6.5 *Any two such as:* ✓✓

Cant delete a transaction

No one company owns it.

Company's servers can't go down

(2)

QUESTION 7

7.1

7.1.1 Validation is an automatic computer check to ensure that the data entered is sensible and reasonable. ✓ It does not check the accuracy of data.
For example, a secondary school student is likely to be aged between 11 and 16.
The computer can be programmed only to accept numbers between 11 and 16.
✓ Any valid example (2)

7.1.2 Range, logical, format, presence ✓✓ ANY TWO (2)

7.2 Databases store data in a logical way. ✓ Thus, if you need to sort through data it becomes easier as well as if you need to find entries that adhere to specific criteria. ✓
Accept answers explaining difficulty with processing textfiles/spreadsheets provided that it fully justifies database usage (2)

7.3

7.3.1 Composite key ✓ (1)

7.3.2 New investor that has not yet transacted ✓ (ie no blockID) ✓ (2)

7.3.3 deletion ✓, update ✓ (2)

7.4

7.4.1 Partial – Name dependent ✓ on InvestorID ✓ (2)

7.4.2 Hash algorithm ✓ dependent on currency ✓ (2)

7.4.3 Data redundancy ✓, currency will be repeated of hash algorithm ✓ (2)

7.5

7.5.1 The SQL statement will let the user view the investor, the block identification number, currency used in the mining transaction and the money generated from the transaction being processed. ✓ However, it will only display the records that has generated more money ✓ than the average of the money generated between all investors. ✓ (3)

7.5.2 **InvestorTbl**(InvestorID, InvestorName, InvestorSurname)

TransactionTbl(InvestorID, BlockID, Timestamp, Currency)

CurrencyTbl(Currency, HashAlgorithm, MoneyGenerated)

ComputerTbl ✓ (InvestorID ✓, BlockID ✓, IP ✓, name) ✓ underlined ✓ (6)

QUESTION 8

- 8.1 Investor✓ (1)
- 8.2 The methods and fields✓ of the defined object are all combined in the same class. ✓ (2)
- 8.3
- a. It is used by a method✓ in the same class. ✓ (2)
- 8.4 They are referring to the two constructors that have the same name but a different number of parameters. When the programmer does not have all the parameters✓, or wishes to use default values✓. (2)
- 8.5 + getInvestor()✓ : String or any other valid getter. (1)
- 8.6
- 8.6.1 Easy to scale✓, do not need to keep elements aligned when swopping. ✓ (2)
- 8.6.2 An array of string lists the names✓ of all investors and is used to instantiate the array of objects. etc. ✓ (2)

QUESTION 9

- 9.1 The search will run through the whole array✓ instead of stopping the loop process after the value has been found. ✓ (2)
- 9.2 A while loop and a flag should be used✓ OR call a method and return in the loop.✓ (1)
- 9.3 Yes. The nested if-statements can be rewritten as one if statement with an AND in between, but the AND should be short-circuiting when the username is not found. ✓
Example: if (arrInvestors[countInvestors].getID = ID && ✓
arrInvestors[countInvestors].getPassword = password) (2)
- 9.4 The count must go to the number of elements in the array less 1. The count starts from 0 so you always have to subtract 1 from the number of elements in the array. If the array is not filled to the size of the declared array, the contents of the array will be null. ✓
When the element at position size is reached✓ (2)
- 9.5 * Begin **while**✓ **Loop** countInvestors from 0 to **less**✓ than the number of elements in the Array less 1 **and found is false**✓
 Check if the id of the investor matches the id of the investor in the array at position loop **and**✓ Check if the password of the investor matches the password of the investor in the array at position loop
 Begin
 found ← false
 End If
 countInvestors ← countInvestors+1✓
End Loop
End Method (5)