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GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 16 pages.

SECTION A: SHORT QUESTIONS**QUESTION 1**

- | | | | |
|-----|--------|---|-----|
| 1.1 | 1.1.1 | A✓ | (1) |
| | 1.1.2 | D ✓ | (1) |
| | 1.1.3 | A ✓ | (1) |
| | 1.1.4 | C✓ | (1) |
| | 1.1.5 | B ✓ | (1) |
| 1.2 | 1.2.1 | Hotspot ✓ | (1) |
| | 1.2.2 | Hot swappable/pluggable ✓ | (1) |
| | 1.2.3 | Computer worm ✓ | (1) |
| | 1.2.4 | Botnet/Bots/Zombie PC's ✓ | (1) |
| | 1.2.5 | Wiki ✓ | (1) |
| | 1.2.6 | Firewall ✓ | (1) |
| | 1.2.7 | (Update/delete) anomaly ✓ or redundancy | (1) |
| | 1.2.8 | Push ✓ technology/notification | (1) |
| | 1.2.9 | Rootkit ✓ | (1) |
| | 1.2.10 | Overflow ✓ | (1) |

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES**QUESTION 2**

- 2.1 2.1.1 Windows ✓ (1)
- 2.1.2 *Any THREE functions of an operating system: ✓✓✓*
- Supply an interface/GUI/UI
 - Manage all the processes and tasks/apps/software
 - Manage the computer memory/RAM
 - Manage the input and output to and from the computer system
 - Manage all disk drives/hardware (3)
- 2.1.3(a) *Multitask processing:*
The computer appears to run multiple programs ✓ at the same time/simultaneously by sharing processing time of the CPU ✓ between processes/tasks
- Concepts:*
- *Any indication of multiple programs/applications*
 - *Sharing of CPU time between programs* (2)
- 2.1.3(b) *Multithreading:*
When a single program is broken up into independent parts/threads✓ that run at the same time ✓.
- Concepts:*
- *Program/application is split into parts/threads*
 - *Independent processing* (2)
- 2.2 4/multiple processor cores ✓ on one CPU chip (1)
- 2.3 Any TWO ✓✓
- The amount of RAM that can be addressed by the operating system (32 bit and 64 bit operating system) is limited
 - The number of RAM slots on the motherboard is limited
 - The cost of RAM – expensive
 - RAM stores current instructions being processed
 - The hard drive is storage of all data/software (2)
- 2.4 2.4.1 *Any ONE ✓*
- Allows connection/access to the Internet/different networks
 - Explanation of routing (1)
- 2.4.2 LTE/Wi-Fi ✓ (1)

- 2.5 A graphics card generates images ✓ faster using the GPU (graphics processor unit).
The use of a separate video card will allow the CPU to focus on carrying out program instructions ✓ thus reducing the load on the CPU.

Concepts:

- *Generation of images/graphics card has own processor*
- *Taking load away from CPU/GPU is faster at generating images* (2)

- 2.6 Cache memory is high speed memory that stores data and instructions ✓ most likely to be needed next by the CPU, preventing the CPU from having to load it from the slower RAM ✓

Concepts: Any TWO

- *Cache is high speed memory*
- *CPU does not have to fetch data and instructions from slower RAM*
- *Stores data and instructions most likely to be needed next by the CPU*

1 mark only: Caching is preventing a slow process from slowing down a faster process (2)

- 2.7 2.7.1 The operating system detects the new device ✓ and installs the drivers automatically ✓

OR

The flash drive makes itself known to the operating system and then the operating system configures the drivers for use

Concepts:

- *Operating system detects new device*
- *Installation of device drivers/automated configuration* (2)

- 2.7.2 By sending a hardware interrupt signal (IRQ) ✓ (1)

- 2.8 Allows the user to access the latest version of the files ✓ on different devices. ✓

OR

Changes in files are automatically updated between devices

NOTE:

Do not accept: add or access from anywhere/online/backup (2)

- 2.9 Indexing the files means that the operating system has an index that includes the text inside the files as well as the file names. ✓
It allows you to search for words or phrases that you can remember that might be inside the document instead of just for a file name. ✓

Concepts:

- *Storing additional information about the files/content of files*
- *Faster/easier location of files* (2)

- 2.10 2.10.1 Any ONE ✓

- SSD
- ROM
- EEPROM
- Hard drive (HDD) (1)

- 2.10.2 Any TWO ✓✓

- Smaller display areas
- Input constraints/limited number of input devices
- Limitation in hardware/processing capabilities
- Limited memory
- Limited storage space on mobile devices
- Extending battery life/limiting power usage
- Availability of facilities such as GPS/Accelerometer, etc.
- Compatibility between devices
- The amount of data that the application will use (2)

TOTAL SECTION B: 27

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES**QUESTION 3**

- 3.1 3.1.1 *Any ONE ✓*
 • UTP/STP (CAT 5/CAT 6)
 • fibre optic cables
 Also accept: co-axial cables (1)
- 3.1.2 Star ✓ (1)
- 3.1.3 (a) TCP/IP (IPv4/IPv6) /Internet protocol ✓ (1)
- 3.1.3 (b) http/https ✓ (1)
- 3.2 The user can log on over a public network ✓ like the Internet with the same, if not better, benefits of privacy and security ✓ of a LAN.
- Concepts:*
 • *Secure log on/secure connection*
 • *From remote location/over Internet/public network* (2)
- 3.3 3.3.1 Invisible ✓ data capturing (1)
- 3.3.2 Any ONE real life example of data capturing ✓ and explanation ✓
 • Buying with credit card or using a loyalty card – type of products you buy/information on your lifestyle
 • Completing forms – extra information that is not always relevant to form/form does not only go to intended recipient
 • Via the Net – sites you visit or bookmark/comments on social networks/content of e-mails
 • Using e-tags – travel habits/locations visited
 • Telecommunication system – who you call/where you are – predict lifestyle etc.
 Or any other valid example that leaves an electronic trail
- NOTE:**
 Do not accept any indication of theft of personal information (2)
- 3.3.3 Purpose of targeted marketing/supplied information. ✓ (1)

3.4 *Any THREE: ✓✓✓*

- JavaScript/Browser side scripting
- Server side instructions/scripting/code
- SQL stored procedures
- AJAX
- Applescript
- HTML4/HTML5
- PHP
- jQuery
- Python
- Ruby

Or any acceptable verifiable scripting language (3)

3.5 3.5.1 *Cookie:*
A text file ✓ stored on your local computer that is used to save user settings/preferences ✓ for a website. (2)

3.5.2 *Any ONE effect of deleting a cookie: ✓*

- Loss of interactivity
- The next time you open that webpage only default settings are available
- Website/page loads more slowly (1)

3.6 *Any TWO disadvantages of using VoIP: ✓✓*

- Need an Internet connection
- Both users need the same software
- Need to purchase credits to call phones not on the Internet
- Poor call quality (when using a slow connection)
- Data cap can be reached quickly/uses data (2)

3.7 *Any ONE ✓*

- Allows one to locate the position of devices/people
- Navigation capabilities
- Global position system
- Geotagging

Or any other acceptable positioning example (1)

- 3.8 3.8.1 DRM (*Digital Rights Management*) refers to any software which uses some form of encryption ✓ and manages access ✓ to the content of electronic media
- Concepts:*
- *Software using encryption/prevents copying*
 - *Manages access/rights to electronic content/media* (2)
- 3.8.2 *Any ONE area of application of DRM software ✓*
- Digital books
 - Movies/music
 - Computer games/software/apps (1)
- TOTAL SECTION C: 22**

SECTION D: DATA AND INFORMATION MANAGEMENT**QUESTION 4**

- 4.1 4.1.1 *Any ONE reason why ID field may not be integer data type: ✓*
- Leading 0's will not be saved
 - Size of ID numbers will exceed integer capacity/storage size of an integer/number of bytes (1)
- 4.1.2 *Any ONE reason why no other field can be the primary key: ✓*
- All the other fields can contain duplicate values
 - Only **JobCardNumber** will contain unique values (1)
- 4.1.3 Since the **DateStarted** and **DateCompleted** fields are available ✓, the **NumDaysTaken** field can be calculated (1)
- 4.1.4(a) ID ✓ (1)
- 4.1.4(b) tblJobCards ✓ (1)
- 4.2 *Any ONE explanation of verifying information: ✓*
- Ensuring that information corresponds to original information at the source
 - Ensuring that one can prove that data is correct/confirming correctness (1)
- 4.3 • Extract only the first character of the gender entered ✓
- Change the character to uppercase ✓
- Also accept: code/algorithm. (2)
- 4.4 4.4.1 SELECT OrderNum, Description, OrderDate ✓
FROM tblEquipment ✓
WHERE Delivered = false ✓
AND year(OrderDate) = 2016 ✓
- Alternative statements:*
- AND OrderDate like "2016%"
 - AND Year(OrderDate) like "2016%"
 - AND OrderDate between #2016/01/01# and #2016/12/31#
 - AND MID(Str(OrderDate),1,4) = "2016"
 - AND OrderDate >= #2016/01/01# AND OrderDate < #2016/12/31#
 - AND OrderDate > #2016/01/01# AND OrderDate < #2016/12/31#
- NOTE:**
AND should be marked with the second condition (4)

4.4.2 UPDATE tblEquipment ✓
 SET Delivered = true ✓
 WHERE Description = "Broom" ✓

Alternative:

WHERE Description like "Broom%" (3)

4.4.3 SELECT Teacher, ✓
 count(*) as numOrders ✓
 FROM tblClassroom, tblEquipment ✓
 WHERE
 tblClassroom.RoomNumber = tblEquipment.RoomNumber ✓
 GROUP BY Teacher ✓

OR

SELECT Teacher, count(*) as numOrders FROM tblClassroom
INNER JOIN tblEquipment ON tblClassroom.RoomNumber =
tblEquipment.RoomNumber GROUP BY Teacher

NOTE:

- Can use LEFT JOIN or INNER JOIN
- Make use of aliases
- Count any field

(5)

TOTAL SECTION D: 20

SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

- 5.1 5.1.1 *Any TWO advantages of modular programming: ✓✓*
- Easier to debug/fewer bugs
 - Reuse of code/Avoids duplication of code
 - Can be used by other classes/units/programs
 - Allows library programs to be inserted thereby saving time.
 - Different programmers can work on specific modules based on their expertise
 - Collaboration/many programmers can work on same program
 - Shorter algorithms makes the module easier to trace and understand
- (2)
- 5.1.2 *A private function is only accessible from within ✓ the class / unit /form*
A public function is accessible from outside ✓ the class/project /form
- (2)
- 5.2 5.2.1 True ✓
- (1)
- 5.2.2 False ✓✓
- (2)
- 5.3 Loop from 1 to length of word ✓
 reverseWord (✓ addition) ← word[loop] ✓+ reverseWord; (✓order)
 OR
 Loop from length of word down to 1
 reverseWord ← reverseWord + word[loop]
- Concepts:*
- Loop through word
 - Extract character (logic of code must be correct)
 - Add onto new word
 - Order of addition
- (4)
- 5.4 5.4.1 iSum := iSum ✓+ arrLightBulbs ✓ [loop ✓, loop ✓];
- Also accept:
 4 marks - iSum := iSum + arrLightBulbs[r, r];
 3 marks – if any other letter is use for both index values
 e.g. iSum := iSum + arrLightBulbs[x,x]
- If hard coded – max 2 marks
- (4)
- 5.4.2(a) Syntax ✓
- (1)
- 5.4.2(b) Logical ✓
- (1)
- 5.4.2(c) Syntax ✓
- (1)

- 5.4.3 *Reset:* (any ONE) ✓
- Opens an existing text file for reading
 - Moves the file pointer to the first record
- Rewrite:* (any ONE) ✓
- Creates a new text file
 - It clears the content of the existing file
- Do not accept: Writing to file (2)
- 5.5 5.5.1(a) Any ONE: ✓
- Object cannot create/instantiate itself
 - Object does not exist
 - Need to use class name with create
- Do not accept:
- Not allocated to a variable
 - Rewriting of code (1)
- 5.5.1(b) Incorrect order of arguments/parameters ✓ (1)
- 5.5.1(c) Any ONE ✓
- Incorrect data type/type mismatch – string and integer
 - There should not be inverted commas around the number (1)
- 5.5.2(a) Mutator ✓
- Also accept: Auxiliary (1)
- 5.5.2(b) Auxiliary ✓ (1)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 *Any TWO ✓✓*
- IT technician
 - Network engineer
 - Network architect
 - Network administrator
 - Network analyst
- Do not accept:
- Programmer
 - Any job related to database/database administrator (2)
- 6.2 6.2.1(a) *Biometrics:*
The use of personal characteristics ✓ to authenticate the identity of a person
- Also accept: Use parts of the body for access control (1)
- 6.2.1(b) *Any ONE suitable example of biometrics in this scenario: ✓*
- Retina/eye
 - Fingerprint
 - Voice recognition
 - Facial recognition
 - Palm readers (1)
- 6.2.2 *Any TWO ✓✓*
- RFID cards can be read from a distance that can trigger the unlocking of the room even when not required
 - Cards do not validate the identity of the user
 - Cards can be stolen/lost
 - Cards can be cloned
 - Inconvenience of carrying cards around
 - Cost of manufacturing cards (2)
- 6.3 6.3.1 *Virtual memory:*
Hard drive space/storage ✓ reserved by the operating system to be used as RAM/memory ✓
- Also accept for 2 marks: Hard drive space to be used when the RAM is full (2)
- 6.3.2 Operating system ✓ (1)
- 6.3.3 *Any ONE way to limit the use of virtual memory: ✓*
- Add more RAM
 - Do not open too many applications/Close applications not in use (1)

- 6.4 *Lossless* – no data is lost ✓
 Lossy – some insignificant data is lost ✓ (2)
- 6.5 6.5.1 *Protocol:*
 A set of rules ✓ for transmission of data across a network/encoding
 and decoding data for transmission. ✓ (2)
- 6.5.2 (Sending) e-mail ✓ (1)
- 6.6 6.6.1 *Distributed database:*
 Parts of a database ✓ are spread over multiple servers in different
 locations ✓
- Concepts:*
 • Splitting database
 • Multiple locations (2)
- 6.6.2 *Any TWO advantages of distributed database: ✓✓*
- Eliminate congestion on a single server
 • Can handle a large number of simultaneous users
 • The branches of a company can be spread over a large
 geographical area
 • If one server is down, other databases can still be used
 • Lower cost of communication as less data is being
 communicated (2)
- 6.7 6.7.1 *Any ONE : Web 1.0: ✓✓*
- Mainly static web pages
 • Each user sees the same content every time/no interactivity.
- Also accept for 1 mark: Few content creators, many users (2)
- 6.7.2(a) *The Semantic Web:*
- Has the ability to interpret information ✓ like humans and provide
 useful content tailored to user needs/personalization. ✓ (2)
- 6.7.2(b) The Internet of Things ✓ (1)
- 6.8 6.8.1 Online seminar ✓ (1)
- 6.8.2 *Any ONE ✓*
- Comfort of own office/home
 • Saving on travel costs/time
 • Expand knowledge base
- OR any other acceptable answer (1)

- 6.9 6.9.1 *SaaS: Software as a Service* ✓ (1)
- 6.9.2 *Any ONE - Cloud applications:* ✓✓
- Software where most of the processing is done in the cloud/the processing is done by servers which are accessible via the Internet
 - The interface is created on the web servers/on local computers using apps or interface is accessed through a web browser
- Concepts: Any TWO*
- Local user interface
 - Software/applications run on servers on the web
 - Servers/service are accessible via Internet (2)
- 6.9.3 *Any TWO disadvantages associated with using online services:*✓✓
- Software is not owned and a regular fee needs to be paid.
 - Cost of data used when everything is transferred from the cloud can be high.
 - When Internet is down, software cannot be accessed.
 - When the service is down, software cannot be accessed.
 - Exposure to security issues when documents are stored in cloud.
 - Too many users can slow down the service. (2)
- 6.10 RSS is a web or news feed/automatic ✓provision to users of updated content✓ and/or notifications of new content from websites (2)
- 6.11 6.11.1 *Any TWO responsible uses of social networking sites* ✓✓
- Limit time on web/Turn off notifications when doing important work/Switch off mobile device at specific times
 - Try to remove yourself from FOMO
 - Refrain from insulting other people/Bullying
 - Be aware that all posts are public
 - Be aware that the Internet never forgets information/cannot delete information from the Internet
 - Do not share personal information e.g. ID number or bank account numbers
 - Do not befriend strangers
- OR any suitable answer (2)

6.11.2 *Any TWO reasons why cybercrime is prevalent: ✓✓*

- Low risk of physical danger to criminal/not physically present when crime is committed
- Difficult to detect a crime
- Difficult to trace who committed the crime
- Increase use of Internet
- Increased number of online financial transactions
- People's general ignorance and carelessness

(2)

6.11.3 Piggybacking ✓

(1)

6.12 6.12.1 A machine that have a certain amount of autonomous flight capabilities, while still being controlled by a human.✓

OR any similar explanation

Accept: control of flying object

(1)

6.12.2 *Any TWO benefits of 3D printing ✓✓*

- No other complicated machinery needed for manufacturing
- Parts can be computer designed and directly printed
- Easy to change design and print again
- Parts that fail can easily be printed again
- No waiting period for ordered parts
- More cost effective for small numbers

OR any other acceptable answers

(2)

TOTAL SECTION E: 41
GRAND TOTAL: 150