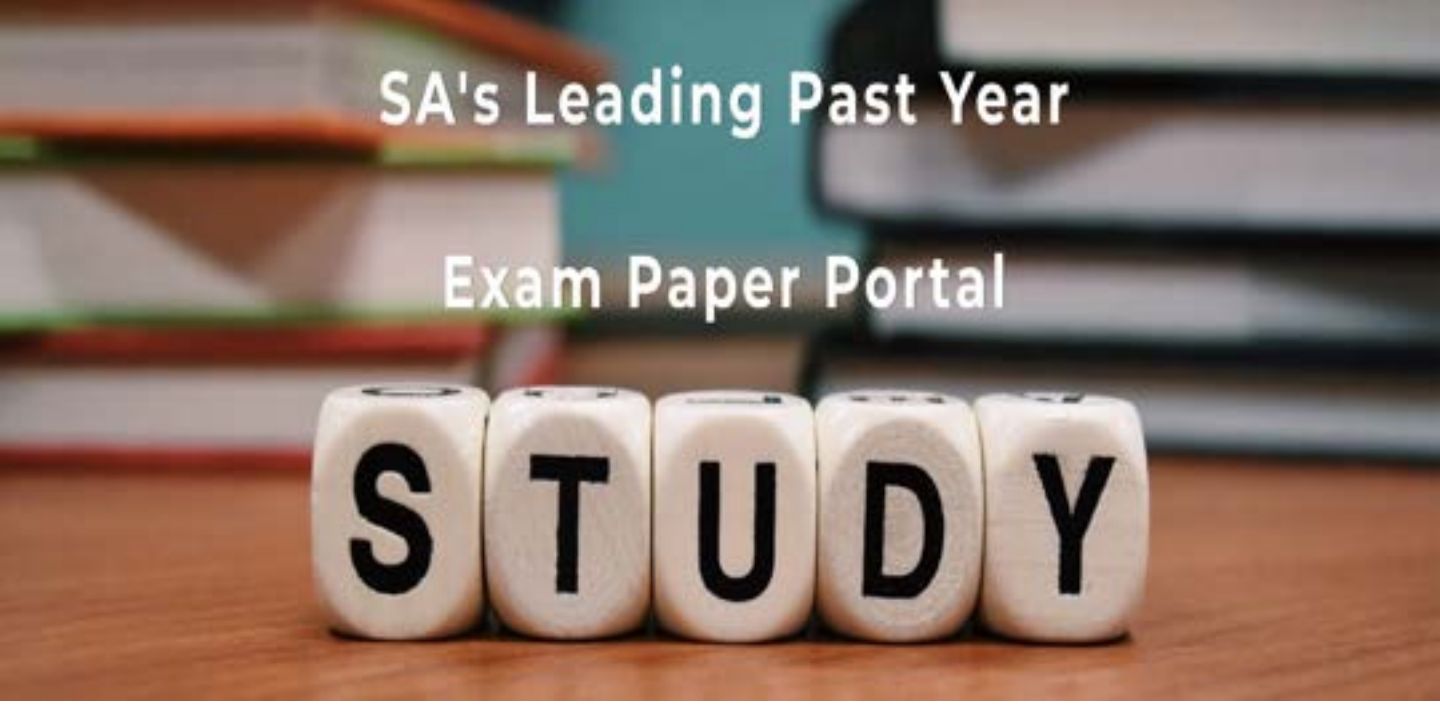

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GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2018

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 17 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1	1.1.1	D ✓	(1)
	1.1.2	B ✓	(1)
	1.1.3	D ✓	(1)
	1.1.4	A ✓✓	(2)
	1.1.5	Faulty question – no possible answer	
1.2	1.2.1	CMOS ✓ (Also accept: BIOS, Firmware)	(1)
	1.2.2	Biometrics/Bio authentication/Any specific correct example such as Voice recognition, Face/Iris/Fingerprint-scanning ✓ Do not accept: Digital fingerprint, only fingerprint/face/iris	(1)
	1.2.3	Digital signature ✓	(1)
	1.2.4	Utility ✓ software	(1)
	1.2.5	Constructor ✓	(1)
	1.2.6	Normalisation ✓	(1)
	1.2.7	Trace table ✓ Also accept: watch facility of the built-in debugger, debugger	(1)
	1.2.8	Lossy ✓ compression	(1)

TOTAL SECTION A: 13

SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

2.1 *Any TWO* ✓✓

- Portable/could walk around to the tables and take orders
- Small in size/easy to fit into hand
- No cabling/Wireless/Can link to system using Wi-Fi
- Touch screens make selecting options quick/easy to use
- Saves time/quicker order taking/billing

There must be a reference to a feature of a tablet relating to placing orders
Do not accept: any reference to cost/cheaper
Do not accept: general answer applicable to any device
Do not accept: answers related to the software/GUI (2)

2.2 2.2.1 *Any TWO hardware components* ✓✓

- CPU/Processor
- Hard drive/storage
- Memory/RAM
- Motherboard (2)

2.2.2 *Any TWO actions for disk cleanup* ✓✓

- Deletes the temporary internet files
- Empties the recycle bin
- Deletes any other temporary files
- Deletes downloaded files
- Debug dump files
- Delete setup log files
- Delete system error memory dump files
- Delete unused/unnecessary/unwanted files (2)

2.3 2.3.1 *Any TWO comparisons between cache and RAM+* ✓✓

- Cache is faster than RAM
- Cache has smaller capacity than RAM
- Cache stores recently used instructions/has a pre-fetch unit while RAM stores the whole program
- Cache found on CPU and RAM on motherboard
- Cache is more expensive per MB than RAM
- Cache is SRAM/static and RAM is DRAM/dynamic
- It is easier to upgrade RAM (2)

2.3.2 The device driver facilitates communication ✓ between the computer and the printer/hardware ✓
OR
The device driver allows the operating system/computer to communicate/control/manage the hardware/printer
OR
The device driver converts the basic instructions of the operating system/computer to messages that can be interpreted by the hardware component.

Concepts:
- Communication/converting instructions
- Hardware/printer (2)

2.3.3 To license the use of the software/prevent illegal copies of software from being used ✓
OR
Make all/licensed features of the software available (1)

2.3.4 (a) *Any ONE advantage of installing updates:* ✓

- Always have latest functions/features
- Bugs and problems are resolved
- Security loopholes are fixed
- Increase performance/work faster (1)

2.3.4 (b) *Any ONE disadvantage of installing updates automatically:* ✓

- Unexpected/unplanned use of data
- A hastily released update may cause more problems than it fixes/lose existing/familiar/pre-set features
- Unwanted features/preferences
- Slows system down (due to background processes)
- Unwanted restart/inconvenient timing of update (1)

2.3.5 (a) When RAM fills up/is full✓ (1)

2.3.5 (b) The operating system makes use of hard drive space ✓ as extra RAM ✓

OR

- Uses (dedicated) area on HDD/storage
- Moves unused data to HDD/virtual memory where it will easily be accessible again (2)

2.4 2.4.1 *Any ONE*: ✓

- Physical damage
- Power surge

Also accept examples of physical damage such as dropping a PC can cause a hard drive head crash while transporting/Spilling water on motherboard or HDD with PC case open

Do not accept: Any example or mention of data being damaged (1)

2.4.2 UPS/Invertor ✓ (1)

2.4.3 *Backup*:
A duplicate copy ✓ of a file is created on another device/for use when the original copy is damaged or lost ✓

Archiving: ✓
Less frequently used/outdated/older files (can be compressed) and stored where they can be retrieved when necessary (3)

2.4.4 Monitors communication with computer/system and the internet/other networks✓ and blocks unauthorised communication✓ by software/malware (2)

TOTAL SECTION B: 23

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 *Any TWO advantages of networks* ✓✓

- Fast and efficient communication
- Centralisation of data/data always up to date
- Transfer of files between devices
- Leisure/LAN computing games/Watching movies
- Increased control and security (2)

3.2 3.2.1 An NIC is used to encode or 'convert' the data so that the data can be transmitted over a specific medium and it decodes the data that is received.

Concepts:
- Decode/Encode ✓
- Making communication between devices possible ✓ over a network (2)

3.2.2 Radio waves ✓ (1)

3.3 3.3.1 Fibre Optic cables ✓ (1)

3.3.2 *A reason and explanation for addressing poor signal strength*: ✓✓

A device/technique with a valid explanation

Also accept : *Any TWO of the following-*
- Provide sufficient/multiple access points
- Interference by structures should be limited by strategically placing access points/line of sight
- Use a repeater/booster/amplifier/device/router to increase signal strength/WiMax
- Limit the noise by making use of different frequencies (2)

3.3.3 *Any TWO reasons for using WiMax:* ✓✓

- Greater range
- Faster/faster communication
- Provides higher bandwidth/data transfer
- Better security (2)

3.4 3.4.1 The Semantic Web refers to a web where the content has been optimised for computers and devices to filter content intelligently to be able to navigate without human intervention or involvement.

Concepts: Any TWO for Semantic web ✓✓
- Content optimised
- Filter content intelligently
- Without human involvement (2)

3.4.2 *Any ONE reason for using metadata*: ✓

- To supply additional data on which specific searches are done.
- Searching is optimised
- Improved results

Accept any explanation that metadata is used to improve results on specific searches. (1)

3.5 3.5.1 POP3 ✓ (1)

3.5.2 Notification – The user is notified ✓ by a sound or message that a new e-mail has arrived
Push Technology – The user receives the e-mail ✓/is notified and the e-mail is automatically downloaded to the device (2)

3.5.3 A link/folder ✓ is shared ✓ with another user.

Concepts for making large files available:
- Folder/Link provided
- Storage shared (2)

3.5.4 (a) Phishing is a technique to obtain personal/sensitive information ✓ from a user that appears to be from a legitimate institution in order to trick the user into providing information. ✓

Concepts of phishing:
- Provide information about self
- Appears to be legitimate/tricking you (2)

3.5.4 (b) *Any ONE example of phishing*: ✓

- Request to confirm bank details
- Request to provide pin number for bank cards
- Request to confirm user name and provide password
- Request personal information (1)

TOTAL SECTION C: 21

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 *Any ONE example of the role of a database in a POS* ✓

- When a transaction takes place, the database is updated to increase or reduce the stock items/items available/Relevant data obtained at POS is stored for the restaurant
- Customers details are updated as they pay for meals
- Accounting information is updated as customers pay
- Obtain the (latest) item information/prices from the database
- Can do calculations/generate statistics

OR

Any other valid example to do with data in a sales environment (1)

4.2 4.2.1(a) *Any ONE* ✓

- String
- Text (1)

4.2.1(b) *Any ONE* ✓

- Boolean
- YesNo
- True/False (1)

4.2.2 The table will be sorted according to initial and not surname. ✓

OR

The waiter's initial and surname are captured in one field/Initials captured as the first section of the initial and surname field. (1)

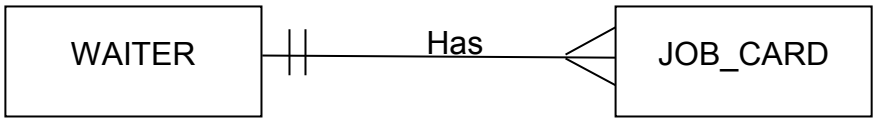
4.2.3

	tblJobCard	
PK	JobCardNr	✓(a)
	NormalHoursWorked	
	WeekStartDate	✓(b)
	HoursOvertime	✓(b)
FK	WaiterID	✓(b)

(b) ✓ TotalHours is NOT included
(c) ✓ FK correctly identified

NOTE:
The field names may differ from those in the above table (6)

4.2.4 One Waiter has many Job cards



Mark allocation
✓ Correct ER diagram format
✓ One (Waiter) to many (Job_Card) relationship
✓ Placing entities in correct relationship/order (3)

4.3 4.3.1 *Any ONE issue that threatens physical integrity* ✓

- Power failure
- Natural disasters
- Mechanical failure of hardware
- Theft of devices (1)

4.3.2 *Any TWO aspects to ensure logical integrity*: ✓✓

- Data validation/validation rules
- Each record has a unique primary key
- Normalisation rules applied
- Ensuring referential integrity/Foreign key must refer to an existing record in the other table
- Verification of data (2)

4.4 *Any THREE responsibilities of a database administrator:* ✓✓✓

- Design the database
- Security of the database/access rights
- Backup and restoration plans and policies/updating software
- Monitoring the performance of the database
- Manage/maintain the database. (3)

4.5 *TWO benefits of having a server DBMS:*

Managing simultaneous multiple connections to the database to execute the transactions/It will allow a large number of users to connect simultaneously to a database

Concepts:
- Multiple connections/users✓
- Simultaneous access✓ (2)

4.6 4.6.1 *Any ONE reason for security*: ✓

- Data is transmitted across networks
- Multiple servers are used/Many systems are used
- Create security exposure on multiple fronts/many users (1)

4.6.2 *Any ONE benefit of working with a distributed database:* ✓

- Faster performance /less congestion
- Less downtime
- If connection is interrupted, database is not damaged/corrupted (1)

4.6.3 *Partitioning:*
Each site manages its own part of the database ✓ and uploads data to a central database in a scheduled batch process. ✓

Concepts:
- Local data
- Uploaded to central database (2)

TOTAL SECTION D: 25

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 5.1.1 *Any TWO guidelines for readable code*: ✓✓

- Commenting of code
- Descriptive variable names
- Modularity
- Indentation
- Open lines between sections
- Collapsible regions (2)

5.1.2 An algorithm is a possible solution to a problem ✓ which contains a set of steps/instructions ✓

Concepts:
- Set of steps/instructions
- To perform a task/solve problem (2)

5.1.3 (a) Debugging is the technique/process of finding ✓ and resolving ✓ defects/problems/errors/bugs. (2)

5.1.3 (b)(i) A runtime error is an error that causes termination or break in the running of a program. ✓

Do not accept: Prevents from running (1)

5.1.3 (b) (ii) *Any ONE example of runtime error*: ✓

- Division by 0
- Data type mismatch/typing in a word instead of a number
- Reference to an index in an array that is not part of the declaration
- Attempting to access a resource/file that is not available.

Also accept other valid examples. (1)

5.1.4

WHILE…DO	**REPEAT…UNTIL**	
Executed while condition is true	Executed until condition is true	✓
The statements may not be executed at all depending on the condition	Executed at least once irrespective of condition	✓

(2)

5.1.5 Statement 1: variable X := 5 mod 2;
Integer/Real/Any number type ✓

Statement 2: variable Y := 5 mod 2 = 0;
Boolean ✓ (2)

5.2 5.2.1 Creates a link between the external/physical/textfile file ✓and file variable/logical file ✓ in the program (2)

5.2.2 *Any ONE reason for replacing append with rewrite ✓✓*

- The file will be emptied/ the contents will be removed
  OR
- Rewrite statement will replace/overwrite the current contents of the text file with Mrs Smith.

Do not accept: create a new file (2)

5.2.3 *Any ONE reason for I/O Error: ✓*

- The file was not closed in during a previous procedure/The file buffer was not cleared/The file is corrupt
- The file was not correctly assigned
- Append or rewrite was not used to open the file/Reset was used to open the file
- Writeln-statement does not refer to the text file (example: writeln(sline))
- The executable file is not in the same directory/folder as the text file
- The file was closed (1)

5.3 5.3.1

PIN	x	c	Is x < 1?	Is c <>5?	Display
623	623	0			
	62.3✓				
		1✓			
			False✓		
	6.23✓				
		2✓			
			False✓		
	0.623✓				
		3✓			
			True✓		
				True✓	
					Error in PIN ✓
No extra details ✓					

(12/2 = 6)

5.3.2 *Any ONE of*: ✓

- c = 5
- The user must enter a pin number which contains 5 digits. (1)

5.4 **Marking Concepts:**
1 mark – Inner loop
1 mark – Loop to correct counter
1 mark – Formulate a display
1 mark – Display in correct position
1 mark – Reset display variable/ move to next line

Line	Algorithm_Display_Pattern
1	Input number
2	Loop counter ← 1 to number
3	output ← " ✓
4	Loop counter2 ✓ ← 1 to counter ✓
5	output ← output + counter2 ✓
6	EndLoop counter2
7	Display output✓
8	EndLoop counter

Concepts:
1 mark – Clear output variable in correct position
1 mark – Inner loop correct position
1 mark – Inner loop (counter2) from 1 to outer loop counter
1 mark – Add inner loop counter to output string
1 mark – Display output string outside inner loop, inside outer loop

ALTERNATE SOLUTION

Line	Algorithm_Display_Pattern
1	Input number
2	Loop counter ← 1 to number
3	Loop counter2 ← 1 to counter
4	Display counter2 (one character)
5	EndLoop counter2
6	Move to next line
7	EndLoop counter

Accept any other valid algorithm (5)

TOTAL SECTION E: 29

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1 6.1.1 An area where wireless/Wi-Fi/ Internet✓access is available/connected/shared ✓ (2)

6.1.2 Un-encrypted data/files that are sent can be intercepted ✓

OR

Any other acceptable example of personal information being exposed/hacking/threat of malware/viruses (1)

6.1.3(a) A peer-to-peer protocol/network ✓for downloading files from the internet

OR

A file sharing software (1)

6.1.3(b) *Any TWO reasons to block BitTorrent* ✓✓

- Security issues
- To prevent piracy of software
- Data use/Data cap
- Congestion/Slow down performance of network (2)

6.2 6.2.1 Virtual Private Network ✓ (1)

6.2.2 Allows users to log into a network via the internet with the same security of a LAN.

Concepts: Any TWO ✓✓
- Log in via Internet
- Remotely
- Secured network/connection (2)

6.3 6.3.1 (a) Dynamic page ✓

Any ONE motivation: ✓
- Additional parameters are included that provide information to the software on the server in order to generate a dynamic page.
- ASP (Active Server Pages) are dynamic in nature. (2)

6.3.1 (b) *Any ONE for a mobi website* ✓✓

- Ends with .mobi

OR

- M prefix (2)

6.3.2 (a) *Any TWO hints to use less power* ✓✓

- Turn off devices when not in use
- Change screen settings to dim
- Use automatic app that puts apps to sleep
- Close unnecessary apps
- Turn off Wi-Fi when not in use
- Turn off Bluetooth/GPS when not in use (2)

6.3.2 (b) *Any ONE way to reduce impact on environment* ✓

- Send old equipment to e-cycler/for recycling
- Donate useful equipment to others
- Re-use parts, that is still usable, in other computers (1)

6.3.3 SEO/Search (engine) optimisation ✓ (1)

6.4 6.4.1 *DDoS:*

Many bot computers are used to bombard the servers hosting the restaurants website with a large number of requests ✓ , the servers are over loaded and cannot respond so the website becomes unavailable ✓

Concepts:

- High number of requests/overloaded with requests
- Website becomes unavailable (2)

6.4.2 *Any TWO measures to prevent cybercrime* ✓✓

- Install and update anti-virus software
- Use a firewall
- Use a strong password
- Make sure software is updated regularly
- Be aware of trends in cybercrime/Training of staff to be vigilant
- Not answering to phishing mail
- Make use of encryption
- Human verification/Captcha (2)

6.5 6.5.1 The app is connected to the Internet. ✓
The front end of the app is installed on the device, and the data is accessible/stored in the cloud/web server. ✓ (2)

6.5.2 *Any TWO reasons for the popularity of apps*: ✓✓

- Interface is easier to navigate
- Has a dedicated purpose
- Apps knows where to find data/do not have to enter URL's
- All the interface data already installed on your device/ speeds up responsiveness/use less data
- Can fetch data in the background
- Give notifications
- Can work with syncing device/online storage
- Can use additional sensors like GPS (2)

6.5.3(a) GPS ✓ (1)

6.5.3(b) *Any TWO benefits of a check-in service*: ✓✓

- Users will know if friends visit restaurant and can join them
- Profiling of customers
- Advertising specific deals/Marketing strategy
- When some-one is near restaurant invite them
- Easily reached for online orders
- Invisible data capture
- Feedback from customers (2)

6.6 6.6.1 The purpose of a data warehouse is to provide storage for large amounts of data ✓ and tools to access the data ✓ for data mining purposes.

Concepts:
- Large amount of data stored
- Using the data (2)

6.6.2 *Any TWO roles played by people in data-mining process* ✓✓

- Select/gather/prepare data sets
- Interpret/reporting
- Verify data mining results
- Develop data mining software/algorithms

Also accept: specific examples (2)

6.6.3 To identify hidden trends that can be used to make management decisions for example purchasing more stock for the months with high customer volumes.

Concepts:
- Identifying trends/patterns ✓
- Using information in a practical way in the restaurant context ✓

Also accept: Valid examples and explanation of the use of the data in the restaurant context (2)

6.7 6.7.1 *Any TWO advantages for using an online application* ✓✓

- Don't need local powerful resources/processing done elsewhere
- Is not installed on system/saves hard disk space
- Always the latest version available/automatically updated
- Run in the browser
- Can be used on any device
- Can be used from anywhere where there is Internet access
- Automatic online backup of data

Do not accept: Functionality or Cost. (2)

6.7.2 Do not need internet access ✓ to use the software. (1)

TOTAL SECTION F: 37
GRAND TOTAL: 150