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SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

INFORMATION TECHNOLOGY P2

2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 13 pages.

SECTION A: SHORT QUESTIONS**QUESTION 1**

1.1	1.1.1	G✓	(1)
	1.1.2	I✓	(1)
	1.1.3	A✓	(1)
	1.1.4	N✓	(1)
	1.1.5	E✓	(1)
	1.1.6	L✓	(1)
	1.1.7	H✓	(1)
	1.1.8	K✓	(1)
	1.1.9	J✓	(1)
	1.1.10	C✓	(1)
1.2	1.2.1	SSD – solid state drive	(1)
	1.2.2	Driver	(1)
	1.2.3	Software as a service (Saas)	(1)
	1.2.4	Convergence	(1)
	1.2.5	Cookie	(1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES**QUESTION 2**

- 2.1 Point to point connections between components (not devices) are not shared/ are dedicated ✓ providing high data transfer speeds ✓ (2)
- 2.2 2.2.1 Quad-core ✓ (1)
- 2.2.2 A task is separated into different threads ✓ that can be processed simultaneously ✓ spread/executed on/by different cores. (2)
- 2.2.3 *Any TWO of:* ✓✓
- Stores data and instructions that may be needed next / recently used / pre-fetched
 - It is high speed memory / closer to (on) the CPU
 - Faster access than fetching from RAM
 - Prevent slower process from slowing down systems (2)
- 2.3 A bus ✓ (1)
- 2.4 *Discuss TWO characteristic of RAM (2 x ✓✓) of the following:*
- RAM has no moving parts and it is completely electronic (Solid State Memory) - Electronic
 - RAM is faster than any mechanical hardware (hard/optical drive) - Fast
 - RAM loses its contents if the power supply is interrupted - Volatile
 - RAM is more expensive per GB than storage - Comparatively expensive
 - It stores data and instructions currently being executed.
- NOTE: Only one mark if the characteristic is mentioned with no discussion (4)
- 2.5 By using one computer ✓ developers can test their software on different operating systems / platforms. ✓ (2)
- 2.6 2.6.1 Firmware is used to control the basic operation of a device. ✓ (1)
- 2.6.2 On a ROM ✓ chip (1)
- 2.7 The CMOS is the type of memory that stores the BIOS settings that can be changed, ✓ while the BIOS contains the essential start-up instructions / does the POST on a computer. ✓ (2)

2.8 *THREE concepts: ✓✓✓*

- Make sure that you have a good backup policy and know how to restore your data / save all your important files in the cloud / syncing of files across devices.
- Make sure you have records of all your licence keys and serial numbers.
- Keep the software installation files/CD/DVD/flash disk in a place where you can easily find and access them.

Concepts:

- Data backup
- Keeping licence keys/ serial numbers
- Keep installation files/CDs/DVD/flash disk

2.9 2.9.1 8 bits ✓ (1)

2.9.2 *Any TWO of ✓✓*

- Ease of access/speed
- This enables the user to better search for a file using words or phrases that might appear inside the document.
- The operating system has an index that does not only include file names, but also include words and parts of text inside the file.

(2)

2.9.3 *Any ONE of ✓*

- To remove temp files downloaded from the Internet
- To remove deleted files and folders by emptying the recycle bin
- To remove temp files created by operating system
- To remove components of operating system that are not used
- To remove installed programs that you no longer/seldom uses
- To free up/open up additional space on the HDD
- To improve the access speed of the device

(1)

TOTAL SECTION B: 25

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

- 3.1 3.1.1 Ethernet ✓ (1)
- 3.1.2 Any TWO of ✓✓
 • New devices can easily be added/removed/set up on the network.
 • Easy to troubleshoot/maintain
 • If any connected device breaks, the rest of the network is not affected.
 • Network traffic can be managed more effectively (2)
- 3.1.3 A switch connects many computers ✓ on the same network and has the ability to direct network traffic to the correct port / lessens network traffic. ✓ (2)
- 3.2 3.2.1 The person/point from which a downloaded file is being shared ✓ (1)
- 3.2.2 Internet: Any ONE ✓
 • The Internet shares information accessible to everybody.
 • Internet - much larger network than an Intranet / unlimited resources
- Intranet: Any ONE ✓
 • An Intranet shares information / is accessible privately/ limited group.
 • Intranet – small network with limited resources (2)
- 3.3 3.3.1 VPN ✓ (any explanation implying VPN) (1)
- 3.3.2 It is a loophole that is programmed into software ✓ that is used to bypass the security ✓ controls in the network/computer/program. (2)
- 3.3.3 All changes/updates of the files will automatically be copied to ✓ all the devices linked to online storage/folders. ✓ (2)
- 3.4 3.4.1 Customised: A search in which the results are customised by search engines (like Google) to match one's profile of interests and activities. ✓
- Context aware: A search in which additional information (e.g. one's present physical location) is used as criteria to make search results more relevant. ✓ (2)

- 3.4.2 Advertisers pay for sponsored links to appear ✓ even when not relevant to the search. ✓
OR
The user often sees sponsored links first on the results page and these links do not always take you to a relevant information/website. (2)
- 3.5 3.5.1 *Any TWO of* ✓✓
Javascript, Pearl, Ruby, ASP.net, Python, PHP, HTML-5 (not without 5) (2)
- 3.5.2 Retrieves information from a database on the web server using the profile of the user ✓ for whom the web page is dynamically created on the server before downloaded to your browser. ✓
- Concepts:
- Personal information obtained from a database on the webserver
 - Web page is created on the server before downloaded. (2)
- 3.6 DSS analyses the information gathered and presents it in a summarised or graphical format suitable for making informed decisions.
- Any TWO of the following concepts:* ✓✓
- Analyse information
 - Presents information in a summarised or graphical format suitable
 - Assists in informed decision making/decision support system (2)
- 3.7 The quality of information - can be questionable as anybody can create/edit the information. ✓
OR
The bias of editors - any editor can select/edit the information to promote his/her point of view. (1)

TOTAL SECTION C: 24

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

- 4.1 4.1.1 To uniquely identify a record in a table. ✓ (1)
- 4.1.2 There can be more than one store in the mall that opened on the same day. ✓ (1)
- 4.1.3 StoreID/StoreNumber. ✓ (1)
- 4.2 4.2.1 **Normalisation** is the process of efficiently designing a database ensuring data integrity✓ and eliminating data redundancy.✓
OR
Designing a database to prevent anomalies and data redundancy. (2)
- 4.2.2 NumYearsOpened can be calculated✓ using the DateOpened field.✓ (2)
- 4.3 *Any TWO of* ✓✓
- Test for the format of the date e.g.
 - format must be yyyy/mm/dd.
 - Test if the date is in the correct range e.g.
 - the date the shop opened was after the date that the mall opened
 - check that the date is not in the future.
 - Presence check – a date was entered or selected.
- NOTE: In each case accept an explanation or a suitable example. (2)
- 4.4 4.4.1 *Any ONE of:* ✓
Has
Employs
Also accept any other sensible action verb that describes the relationship. (1)
- 4.4.2 B One to many ✓ (1)
- 4.5 4.5.1 False✓ (1)
- 4.5.2 True ✓ (1)
- 4.5.3 True ✓ (1)
- 4.5.4 True ✓ (1)
- 4.5.5 True ✓ (1)

- 4.6 Any TWO of ✓✓
- To make the data more suitable for data mining.
 - Data need to be compressed to limit size.
 - Data need to be standardised to the same format as the data in the data warehouse. (2)
- 4.7 Any ONE of ✓
- To access the history of the record.
 - To reinstate the record / provide for recovery if records are deleted accidentally.
 - For auditing purposes. (1)
- 4.8 Any TWO of ✓✓
- Slows down the network traffic because of the large volume of data being communicated/overloading.
 - High data charges (cost).
 - The risk of the whole business shutting down when the central database is down. (2)
- 4.9 Any TWO ✓✓
- Validate data fields.
 - Provide only certain options for example using a component where input can only be selected.
 - Limit size of fields to be entered.
 - Use parameterised queries. (2)
- 4.10.1 Online data collection is where data is processed immediately✓/in real time after it has been captured or collected. ✓
OR
Data is captured/recorded and saved directly/immediately onto a system (2)
- 4.10.2 Any ONE example ✓ with the benefit/use of data ✓
- Possible answers:
- The specific purchases are recorded – business establishes buying patterns of clients.
 - The bank that clients use is recorded – business can use it as bargaining tool with bank.
 - The time of day that purchase is made – can plan for rush hours.
- Also accept other valid answers. (2)

TOTAL SECTION D: 27

SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

- 5.1 5.1.1 Any ONE of ✓
 • Flowchart
 • IPO
 • Pseudo code (1)
- 5.1.2 Any ONE of ✓
 • A programmer of any programming language must be able to understand / code the algorithm
 • Anyone must be able to interpret the algorithm.
 • It is just a planned solution, not a program. (1)
- 5.2 5.2.1 Any ONE of ✓
 • Indent the code
 • Better line spacing/open lines
 • Add comments to code (1)
- 5.2.2 (a) Logical error ✓ (1)
- (b) Concepts:
 Scope:
 • iSum is a local variable in each of the subprograms / not global ✓
 Life time:
 • iSum is again declared 'empty' in each displayAnswer procedure call ✓ (2)
- 5.3 5.3.1 Any ONE of ✓
 iRandom := random(31) + 10;
 iRandom := randomrange(10, 41); (1)
- 5.3.2 (a) (iii) if (iRandom MOD 2 <> 0) then ✓ (1)
- (b) (ii) 8 ✓ (1)
- (c) (iii) Repeat
 ...
 Until iCountOdd = 15; ✓ (1)

- 5.4 5.4.1 Integer ✓ (1)
- 5.4.2 Real/ Double ✓ // the compiler will reject integer because of the sqrt (1)
- 5.5 5.5.1 Accessor method returns the current value of an attribute of an object ✓
Mutator method returns no value but changes the current value of an attribute of an object. ✓ (2)
- 5.5.2 (a) Any ONE of: ✓
 - Accessibility
 - Private and public declaration
(1)
- (b) Any ONE of: ✓
 - To control access from other units/programs
 - Unintentional changes prevented
 - Direct access and change prevented.
(1)
- 5.5.3 setContactNumber ✓ (1)
- 5.6
sLine ← iTerm1 + ' ' + iTerm2 ✓
loop ✓ I from 1 to iNumTerms - 2 ✓
start loop
iTerm3 ← iTerm1 + iTerm2 ✓
sLine ← sLine + iTerm3 + ' ' ✓
iTerm1 ← iTerm2 ✓
iTerm2 ← iTerm3 ✓
end loop
Display sLine ✓ (8)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 Micro waves / Radio waves ✓ (1)
- 6.1.2 *Any TWO of ✓✓*
- To increase the range/ mall can cover a large area
 - There may be a lot of traffic with many users on a single access point / less sharing of available bandwidth / will provide higher access speed
 - Signal interference by structures like walls (2)
- 6.2 6.2.1 Mobile device ✓
OR accept a suitable example such as Smart phone/tablet/smart watch (1)
- 6.2.2 The trend that mobile devices increasingly use apps ✓ to access web-sites directly rather than via a browser. ✓
OR
The web is the backend and the app is the front end. (2)
- 6.2.3 *Any ONE for two marks ✓✓*
Designing your program to ensure the continuing function of a piece of software under unforeseen circumstances.
OR
When a programmer anticipates problems and writes code to deal with them. (2)
- 6.2.4 *Any TWO of ✓✓*
- Check data for consistency and integrity
 - Use try/catch
 - Range checking
 - Format checking
 - Using pre-defined lists / combo box
 - Check if items are selected or input entered from components (2)

- 6.3 6.3.1 HTTPS / SSL ✓ (1)
- 6.3.2
- Public key sent to the person/computer wishing to communicate, sent over the network ✓
 - Public key used to ENCRYPT data/session key that is sent back to institution ✓ (bank),
 - Private key that matches the public key which never moves over network) is used to DECRYPT the data/session key ✓
- Concepts: Marks allocated towards the following:
- Encryption using public key
Decryption using private key
Public key is sent / private key retained by user (3)
- 6.4 6.4.1 Computer-processing where the physical location of people and objects are determined ✓ and used during processing. ✓ (2)
- 6.4.2 *Any ONE of* ✓
- Specific advertisements / notifications when someone walks pass a shop.
 - Request to rate a shop as soon as you visit the shop.
- Any other acceptable answer. (1)
- 6.5 6.5.1 A white hat hacker does not cause damage ✓ they just prove skills/ test security/not committing a crime
A black hat hacker hacks to cause damage ✓ or steal data or commit a crime. (2)
- 6.5.2 The servers become overloaded, unresponsive, and effectively unavailable for everyone. ✓ (1)
- 6.5.3 *Any TWO of* ✓✓
- Loss of revenue due to cost for security
 - Downtime
 - Damage of reputations / losing customers
 - Loss of data
 - Theft of money via web (2)
- 6.6 A fixed physical address that has a reception desk and meeting room ✓ which is used as a shared space by people who otherwise work from a mobile office. ✓ (2)

6.7	6.7.1	Telecommuting ✓	(1)
	6.7.2	List the device ✓ (example filtered microphone / ear phones) Motivation ✓ (example to block out background - sound / block out other conversations)	(2)
	6.7.3	Any ONE of ✓ <ul style="list-style-type: none"> • Skype • Teams • FaceTime • Jitsi • Zoom • WhatsApp calls <p>Any other correct video conferencing platform</p>	(1)
	6.7.4	Any ONE of ✓ <ul style="list-style-type: none"> • Google Drive • One Drive/Share point • Dropbox <p>Any other correct online storage space</p>	(1)
6.8	6.8.1	While Virtual Reality immerses you into a virtual world and blocks out the real world ✓ / Computer based, Augmented Reality refers to overlaying computer-generated images on top of real-time images ✓ / Combines real world images with computer generated images.	(2)
	6.8.2	Any ONE of ✓ <ul style="list-style-type: none"> • The app can have an assistant advertising some products • The app can give you 3D views of some of the items in the shops <p>Good explanation showing knowledge about using AR</p>	(1)
	6.8.3	Any TWO of ✓✓ <ul style="list-style-type: none"> • Camera • Gyroscope / movement sensor • Accelerometers • GPS • Light sensor 	(2)
TOTAL SECTION F:			34
GRAND TOTAL:			150