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SENIOR CERTIFICATE EXAMINATIONS

INFORMATION TECHNOLOGY P2

2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 12 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	B ✓	(1)
	1.1.5	D ✓	(1)
1.2	1.2.1	CAP/Data bundle ✓	(1)
	1.2.2	Blog/Weblog ✓	(1)
	1.2.3	Cracker/Hacker ✓	(1)
	1.2.4	DNS (Domain Name System) ✓	(1)
	1.2.5	HTTPS/SSL ✓	(1)
	1.2.6	Flashing ✓ the ROM	(1)
	1.2.7	Instant messaging (IM) ✓	(1)
	1.2.8	MP3 (MPEG-1 Audio Layer 3) ✓	(1)
	1.2.9	Piggybacking ✓	(1)
	1.2.10	POST (Power-on-self-test) ✓	(1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES**QUESTION 2**

- 2.1 *Any TWO reasons for using thin clients: ✓✓*
- Less hardware required making it cheaper/Do not need very powerful hardware as processing is done by server
 - Less physical space required
 - Software only needs to be installed on server/Programs are loaded onto and shared from server
 - Reduced security threat (2)
- 2.2 2.2.1 On the ROM chip ✓ (OR another type of ROM) (1)
- 2.2.2 *Any TWO functions of BIOS: ✓✓*
- Check that all hardware is connected and in working order/POST
 - Provide user with a menu of setup options for configuration at lowest level/CMOS settings
 - Locate and load operating system
 - Controls hardware at low level (2)
- 2.3 2.3.1 Multiprocessing ✓ (1)
- 2.3.2(a) The main aim is prevent a slower medium ✓ from slowing down the performance of the faster medium. ✓ (2)
- 2.3.2(b) Disk caching:
Every hard drive has built-in fast high speed memory (RAM) ✓ which is used to cache data read from/written to the hard drive and therefore speed up subsequent calls ✓ for the same code/data from the hard drive. (2)
- 2.3.3 *Any ONE: (Naming) ✓ (explanation) ✓*
- Increase RAM/memory – to hold more data and instructions/less use of virtual memory
 - Use an SSD instead of conventional HDD - faster access speeds
 - Better graphics card – faster generation of images and less load on CPU
 - Replace old motherboard with a new board with higher bus speeds – faster data transfer
 - Multi core processor - replacing single core with multi core processor (2)
- 2.4 Converts/translates/changes source code/high level language code ✓ into machine code ✓ that is understandable by the CPU.
- NOTE:**
To create the executable program copy (exe-file) is incorrect as it is not the common task. (2)

- 2.5 Any *TWO* aspects that need consideration: ✓✓
- Compatibility
 - Cost
 - Software requirements
- (2)
- 2.6 2.6.1 Any *TWO* ways of decreasing electricity usage: ✓✓
- Decrease brightness settings of the screen
 - Unplug chargers when not in use
 - Change the balance between power consumption and performance
 - Set devices on sleep/hibernate mode
 - Buy energy efficient devices
- (2)
- 2.6.2 Any *TWO* benefits: ✓✓
- Greater productivity - time is saved by producing electronic documents vs type writers/Electronic communication enhance productivity
 - Information availability – access to current/accurate data/availability of information on the web
 - Fewer employees – will save on payroll expenses
 - Cost saving - do not have to print everything which saves paper
- NOTE:**
Do not award marks for repetition of the same concept or any reference to use of Internet.
- (2)
- 2.7 2.7.1 Any *TWO* ✓✓
Effective backup program includes the following:
- Create a schedule to backup files/Remember to make regular (daily, weekly and monthly) backups
 - Choosing to only backup files that have changed since last backup
 - Use incremental backup
 - Compressing files to save space on the backup media
 - Do not save the backup on the same computer hard drive
 - Keep your backup media saved preferably off-site
 - Backup only user data as software may be reinstalled
- (2)
- 2.7.2 *Disk fragmentation of hard drive occurs when:* complete computer files are not saved in consecutive clusters on the hard drive✓.
- (1)
- 2.8 Any *TWO* ✓✓
- Small physical dimensions
 - No moving parts/more robust
 - Faster data access
 - Uses less electricity
- (2)

TOTAL SECTION B: 25

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

- 3.1 3.1.1 Any TWO ✓✓:
- Easy to install
 - UTP is cheaper than fibre
 - Flexibility
- (2)
- 3.1.2 Router ✓
- Also accept: Any type of modem
- (1)
- 3.1.3 Star ✓
- (1)
- 3.2 Any TWO advantages using a client-server network: ✓✓
- More sophisticated security
 - Better performance (faster)
 - Large storage on server so other computers on the network do not need a large hard disk
 - More suitable for a large number of/multiple computers/users
- (2)
- 3.3 3.3.1 Any ONE reason for updated software: ✓
- Fix flaws that make the computer vulnerable to hackers
 - Fix bugs that could cause a loss of data if program crashes
 - Close security loopholes
 - Add new features to existing software
- (1)
- 3.3.2 Any TWO responsibilities of system administrator: ✓✓
- Make regular backups
 - Create/delete users
 - Manage/monitoring users rights
 - Routine maintenance of files/housekeeping
 - Adding/installing hardware
- (2)
- 3.4 3.4.1 Password protection: to prevent unauthorized access/changes to the data ✓.
- (1)
- 3.4.2 Malware is: software that is specifically designed to install itself without the user's knowledge✓ to negatively affect the computer system. ✓
- NOTE** - Do not accept examples.
- (2)
- 3.4.3 A firewall provides security by monitoring the communication and ports✓ to prevent unauthorised access ✓ through these ports and to the network.
- (2)

- 3.5 3.5.1 Cookie is a text file ✓ that is saved locally on the hard drive after visiting a web site, with configuration settings reflecting the user's preferences. ✓ (2)
- 3.5.2 A dynamic webpage are created by software running on the webserver each time they are accessed. ✓
When a dynamic web page is accessed by different users they will see different content. ✓ (2)
- 3.5.3 Cascading style sheet (CSS) contains the formats for how a particular object should be displayed in a Web browser ✓ and therefore the developer does not have to code separate web pages for individual user configurations/preferences ✓ for example: different colour schemes (2)
- 3.5.4(a) Authenticate the identity of the person/organisation/website ✓ (1)
- 3.5.4(b) Any TWO ✓✓
- Owners public key
 - Owners name
 - Country of origin
 - Date of issue
 - Expiry date of public key
 - Name of issuer
 - Serial number of certificate
 - Digital signature of issuer (2)

TOTAL SECTION C: 23

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

- 4.1 Oracle ✓ (1)
- 4.2 Any TWO ✓✓
 - Data integrity
 - Data independence
 - Data security
 - Data redundancy
(2)
- 4.3 4.3.1 *Record* – collection of fields/1 row of data/particulars of an entity ✓ (1)
- 4.3.2 StartDate or EndDate ✓
Text must change to DateTime data type ✓
NOTE: GuideTelNum cannot be changed (2)
- 4.3.3(a) *Update anomaly:*
If the telephone number of the tour guide Kajal Singh changes ✓
the information must be changed in all the records where Kajal Singh is the tour guide. ✓

Concepts:
 - Telephone number changes
 - Update many records
(2)
- 4.3.3(b) Split the table into more than one table ✓
Each table must have a primary key ✓
Create a 1 to many relationship between the tables ✓ (3)
- 4.3.4 All the records ✓ from the table are deleted ✓
NOTE: Do not accept the table is deleted (2)
- 4.4 The data is mirrored/duplicated ✓ in parallel sets of data so that if one set fails the other will be able to be used. ✓ (2)
- 4.5 *Data mining* - Software is used to identify trends/patterns ✓ in the vast amount of data ✓ (2)
- 4.6 A hacker types a SQL statement ✓ in a data field/query parameter instead of the required data. ✓ (2)
- 4.7 4.7.1 Any TWO of: ✓✓
 - Prevents data traffic congestion on a single server
 - Prevents unnecessary transfer of data
 - System will not be down if a single computer fails
(2)
- 4.7.2 Duplication ✓
Partitioning ✓ (2)

TOTAL SECTION D: 23

SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

- 5.1 5.1.1(a) 1) Combo box/List box/Radio group/Radio button ✓
2) Spin edit/Spinner/Slider ✓
3) Check box/Combo box/Radio group/Radio button ✓ (3)
- 5.1.1(b) Any TWO ✓✓
• Client name
• Date of visit
• Start Date
• End date
• Number of days
Any other valid example. (2)
- 5.1.2(a) (i) Validate data – The data meets the requirement for a specific format/range/data type ✓
(ii) Verified data – The user has confirmed that the correct option was selected/correct data was entered. ✓ (2)
- 5.1.2(b) The accommodation can only be selected ✓ from the selection component's list of acceptable values. (1)
- 5.2 5.2.1 *Logical error* – although the program runs when executed ✓ it produces incorrect results/output ✓ (2)
- 5.2.2(a) • $X \leftarrow \text{counter1}$ ✓
• $Y \leftarrow 3$ ✓ OR (Delphi – $\text{counter2} + 1$)
Also accept:
 $\text{arrNumbers}[\text{counter1}, 3] \leftarrow \text{total}$ (2)
- 5.2.2(b) A ✓ (between lines 6 and 7) (1)
- 5.2.3 2 For $\text{counter2} \leftarrow 1$ to 2 ✓
3 total $\leftarrow 0$
4 For $\text{counter1} \leftarrow 1$ to 12 ✓
5 total $\leftarrow \text{total} + \text{arrVisitors}[\text{counter1}, \text{counter2}]$
NOTE: Ensure that indexes have not been swapped in line 5. (2)
- 5.2.4 $\text{temp} \leftarrow \text{arrVisitors}[5, 1]$ ✓
 $\text{arrVisitors}[5, 1] \leftarrow \text{arrVisitors}[5, 2]$ ✓
 $\text{arrVisitors}[5, 2] \leftarrow \text{temp}$ ✓ (3)

- 5.3. 5.3.1 Object Oriented Programming ✓ (1)
- 5.3.2 It is used to instantiate an object ✓ (1)
- 5.3.3 The number of days can be calculated ✓ from the other fields/attributes. (1)
- 5.3.4 It is only available in the object class. ✓
Or
Not accessible from the driver class or from other classes (1)
- 5.3.5 To change the start date field/attribute ✓ in the object if the original starting date of the booking changed ✓ (2)
- 5.3.6 A toString method is used to combine all the attributes of the object ✓ as a single string ✓ (2)

TOTAL SECTION E: 26

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 *Any ONE motivation for using mobile devices: ✓*
- Convergence/many functions in one devices
 - Can access e-mail
 - Can open and view certain documents
 - Personal organiser
 - Online banking
- Do not accept reference to the size/mobility/portability (1)
- 6.1.2 *Any TWO disadvantages using smartphones: ✓✓*
- Difficult to input data on a small screen
 - Limited battery life - need to be charged regularly
 - Mobile operating system limits the applications
 - Not easily expandable with peripherals
 - Cost of the data used on the phone (2)
- 6.1.3 Online syncing✓ service (1)
- 6.2 *Any TWO methods of gaining access: ✓✓*
- Biometric scanners
 - RFID cards
 - NFC cards
 - Keypads with passwords (2)
- 6.3 6.3.1 Acceptable Use Policy ✓ (1)
- 6.3.2 *Any TWO of the following:✓ ✓*
- What storage devices may be used
 - Which websites may not be visited (internet usage)
 - When computers may be used
 - What e-mail may be used for
 - What actions will be taken against violation of policy
- Any other valid example (2)
- 6.3.3
- Use company time for personal use/distraction by continuous interruption of media alerts✓
 - Misuse of company resources like bandwidth✓ (2)
- 6.4 6.4.1 Intranet is:
- a local private network ✓
 - is available on a browser as webpages✓
- OR**
- The company documents are available through webpages/internet type of environment to the travel agents with access rights on the companies private network (2)

- 6.4.2 Log on to a VPN ✓ (1)
- 6.5 6.5.1 *Any ONE of* ✓
NIC allows the computer to connect to the network.
NIC controls the flow of data to the network (1)
- 6.5.2 The purpose of MAC address is to ensure that the network device has a unique address ✓ (1)
- 6.6 6.6.1 Take a photo using a smartphone/digital camera ✓ (1)
- 6.6.2 *Any TWO reasons for networking devices:* ✓✓
 - Sharing of documents via a NAS
 - Sharing software
 - Ease of communication
 - Sharing of data/documents
 - Centralization of data
 - Improved management of devices and resources
(2)
- 6.6.3 *Any ONE* ✓
 - Bluetooth
 - Wi-Fi
 - Also accept any wireless connection
(1)
- 6.7 6.7.1 *Any ONE* ✓
 - Web browser which runs a cloud based interface
 - Installable front-end interface/application/app
(1)
- 6.7.2 *Any TWO advantages of SaaS:* ✓✓
 - Rent the software instead of purchasing a license
 - Can be installed on multiple devices
 - Can use cloud version on any device
 - Have access to a certain amount of cloud based storage
 - Updates are done automatically/always have latest version
 - Accessible from any device with Internet access
(2)
- 6.7.3 The resources of powerful computers are shared among multiple users – virtual server ✓✓
OR
The resources of many computers are combined to create a super powerful service - to appear as if it is a single machine (2)
- 6.7.4 *Any TWO disadvantages of cloud computing:* ✓✓
 - Need Internet connection/stable connection
 - Security of data
 - Free storage is limited
 - Need to be online to collaborate
 - Is only available as long as company supplying service is in existence
 - Data costs
(2)

- 6.8 6.8.1 Data is scrambled ✓ according to an specific algorithm ✓ (2)
- 6.8.2 *Public key encryption method:* Uses a Public key to encrypt ✓ data and a Private key (secret/hidden) to decrypt ✓ data. (2)
- 6.8.3 *Any ONE disadvantage of using BitCoin:* ✓
• Transactions cannot be cancelled/reversed
• No person/entity is accountable
• Need to register online as a user (1)
- 6.9 6.9.1 Peer-to-peer protocol ✓ to transfer and share large files ✓ across a network/Internet (2)
- 6.9.2 *Any TWO benefits of using BitTorrents:* ✓✓
• Many users can download popular files quickly
• A single person is not responsible for all the costs of making files available for downloading (hosting)/Reduced cost to the host
• Some equality in sharing – as a user downloads files it is also made available for other users to download/share from this computer
• Effective use of download bandwidth
• Client software is usually free (2)
- 6.10 *Any TWO:* ✓✓
• Downloading of Freeware
• Downloading of Shareware/demos
• Downloading registered Propriety software (2)

TOTAL SECTION E: 38
GRAND TOTAL: 150