This memorandum consists of 12 pages.
SECTION A: MULTIPLE-CHOICE QUESTIONS

QUESTION 1

1.1 C ✓ (1)
1.2 C ✓ (1)
1.3 B ✓ (1)
1.4 A ✓ (1)
1.5 D ✓ (1)
1.6 B ✓ (1)
1.7 B ✓ (1)
1.8 D ✓ (1)
1.9 C ✓ (1)
1.10 A ✓ (1)

TOTAL SECTION A: 10
SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

2.1.1 An operating system is (system) software ✓ which manages / controls all the activities that take place in a computer. ✓ (2)

2.1.2 Android ✓ (1)

2.1.3 Any ONE of: ✓
• If the upgrade process is disrupted, the device might no longer function. ✓
• The upgrade software may contain bugs. (1)

2.1.4 • The operating system splits / shares the CPU time between the active programs. ✓
• It appears as if the computer is running multiple programs at once. ✓ (2)

2.2 Any TWO of: ✓ ✓
• Physical size is smaller than HDD
• It is more robust than HDD
• It uses less power than HDD
• It is faster than HDD (2)

2.3.1 Thrashing ✓ (1)

2.3.2 It makes use of space on secondary memory / storage / hard drive ✓ using it as primary memory / RAM. ✓
Virtual memory (one mark only) (2)

2.3.3 It might be difficult to obtain RAM chips / DIMMs that are compatible with the older motherboards ✓. (1)

2.4.1 Each core can process separate programs ✓ at the same time. ✓ OR
Each core acts like a separate CPU making it possible to execute multiple tasks simultaneously. (2)

2.4.2 3Tb HDD ✓ Hard disk size could be reduced (1)

2.4.3 (a) The clock pulses determines the rate at which activities take place ✓ within the CPU, data transmission / processing only takes place at each pulse ✓ of the system clock. (2)

2.4.3 (b) The speed of the system clock ✓ will be multiplied by a specific value ✓ in order to obtain the required clock speed for the specific CPU. Clock multiplication – one mark only (2)
2.4.4 (a) It connects the different components on the motherboard. ✓
OR
The internal buses transfer data and instructions between components. (1)

2.4.4 (b) Point-to-point connections are dedicated connections which cannot be interrupted/shared ✓ and therefore speeds up the operation of the CPU whereas buses are shared between components / carries data between multiple components. ✓ (2)

2.5.1 It can be used in access control ✓ to prevent unauthorised access to laptop ✓
OR a similar description e.g. - used for biometric access control (2)

2.5.2 Any ONE of: ✓
• Retinal scanner
• Face recognition scanner
• Voice recognition (1)

TOTAL SECTION B: 25
SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1.1 Correct layout ✓
Diagram include:
Switch/Hub ✓
Computers ✓

3.1.2 Any TWO of: ✓ ✓
• Easy to troubleshoot
• Easy to replace individual computers
• If one device stops working, network is not disrupted
• Easy to install/set up/maintain

3.1.3 Bus ✓ or Ring

3.2.1 mobility ✓
OR cost saving / easier to set up

3.2.2 Any TWO of: ✓ ✓
• WiFi range is limited.
• Buildings / obstructions might require a distributed layout
• Multiple computers sharing one access point will drastically decrease speed
• An access point can only support a limited number of connections.

3.2.3 Because the signal is broadcasted, it is easy to intercept the data ✓ and therefore the data, and password, can be accessed.

3.3.1 Is the process whereby a close replica of a web site (or e-mail) is created ✓ in order to create a hoax/false webpage that represents another valid site. ✓
OR
Creating a hoax/false webpage that closely represents another valid site.

3.3.2 Any TWO of the following concepts ✓ ✓
• Use anti-virus and anti-spyware software
• Regularly update software / anti-virus
• Don’t open e-mails or attachments from suspicious sources
• Scan external devices before you use them
• Don’t install pirated software / untrustworthy software
• Activate the firewall
• Don’t visit / download from suspicious websites
• Read and obey security warnings on websites / software
3.4.1 • Technology used in the website is not compatible/available on the mobile device, e.g. Flash player. ✓
• The website has not been designed for a smaller screen size/has been designed for larger computer screens. ✓

3.4.2 Bluetooth is used by devices like keyboards ✓ and WiFi is used for wireless networks ✓ two separate technologies.
OR
The mobile device offers two wireless technologies – ONE mark only

3.5.1 VoIP ✓

3.5.2 Any TWO of: ✓ ✓
• Data is expensive.
• Bandwidth of connections is often very low
• Internet connections are not reliable/ not available everywhere.
• Not all schools will have the necessary hardware.

3.5.3 Cross platform means that software is designed to run on different operating systems. ✓

3.6.1 The manager needs to be connected to the Internet. ✓ After that the manager connects to the resource centre’s server ✓ with access being controlled with a username and password. ✓

3.6.2 The desktop of the remote computer appears as a separate application on his computer ✓ which allows him to work with the computer as if seated in front of the computer itself. ✓

TOTAL SECTION C: 27
SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 A desktop database is usually used for single user applications and is installed on personal computers. ✓
A server database is installed on the server and is accessed by the user using a network connection and shared by users. ✓

4.2.1 (a) 1 (DevicesTb) to many (BorrowedTb) ✓
(b) DeviceID in DevicesTb ✓ and DeviceID in BorrowedTb ✓
(c) BorrowedTb has DeviceID as the foreign key ✓ and DevicesTb has DeviceID as primary key ✓

4.2.2 (a) SELECT Make, Type, Value FROM DevicesTb WHERE Type = 'T'
ORDER BY Value DESC
  • Correct fields and table: Make, Type, Value from DevicesTb ✓
  • Condition: Type = 'T' ✓
  • Sorting: ORDER BY ✓ Value DESC ✓

(b) DELETE FROM DevicesTb WHERE Type = 'P'
  • Correct Table: DevicesTb ✓
  • Correct field: Type ✓
  • Correct condition: 'P' ✓

(c) UPDATE DevicesTb SET Value = Value - Value*10%
  • Correct instruction and table: UPDATE DevicesTb ✓
  • Correct field to change: Value ✓
  • Correct calculation: Value - Value*10% ✓ OR Value - Value*0.01 ✓

(d) SELECT MemberID, Type, DateBorrowed FROM DevicesTb, BorrowedTb WHERE DevicesTb.DeviceID = BorrowedTb.DeviceID AND DateReturned IS NULL
  • Correct fields: MemberID, Type, DateBorrowed ✓
  • Correct Tables: DevicesTb, BorrowedTb ✓
  • Connection: DevicesTb.DeviceID = BorrowedTb.DeviceID ✓
  • Correct field in condition: DateReturned ✓
  • Correct condition: IS NULL ✓

4.3.1 • Fine – currency ✓
• DateOfBirth – date ✓

4.3.2 Any TWO of the following: ✓✓
May borrow only two books/no space to borrow more than two books
Repeating fields
Fields are dependent on a field other than the primary key
Two different entities (members/books) included in one table

TOTAL SECTION D: 26
SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1.1 (a) Age: the user has to select from list of options thus preventing invalid input. ✓
    OR prevents typing errors / all possible values displayed / saves time (1)

(b) Gender: only one of the given options may be selected. ✓
    OR prevents both options from being selected / prevents typing errors (1)

5.1.2 Any ONE of: ✓
    • Any character can be saved in a string variable
    • Text box is type string and the surname variable will be of the same type
    • No type casting needed when using the value (1)

5.1.3 An incorrect day may be selected for a specific month ✓ 29 February used in a non-leap year OR 30 February/31 April, etc. ✓ (2)

5.1.4 Any TWO of: ✓ ✓
    • Display what caused the error / Give a specific error message
    • Indicate how error can be corrected
    • The user could be given the option to continue or cancel the current operation. (2)

5.2.1 It is used to create/instantiate ✓ an object. (1)

5.2.2 The attributes are private ✓ /attributes cannot be accessed directly (1)

5.2.3 (a) Auxiliary ✓ (1)

5.2.3 (b) if (age >=10 AND address Not Null) ✓ OR ✓
    (age > 16 AND membership validated) ✓ return true
    else return false ✓ (4)

5.3.1 (a) Read days ✓ (1)

5.3.1 (b) (days > 0) ✓ AND (days < 100) ✓
    NOTE: AND operator must be used. Accept if Java or Delphi code is used. (2)
5.3.2  (a)

<table>
<thead>
<tr>
<th>Count</th>
<th>Count &lt; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>True</td>
</tr>
<tr>
<td>2</td>
<td>True</td>
</tr>
<tr>
<td>3</td>
<td>True</td>
</tr>
<tr>
<td>4</td>
<td>True</td>
</tr>
<tr>
<td>5</td>
<td>True</td>
</tr>
<tr>
<td>6</td>
<td>False</td>
</tr>
</tbody>
</table>

Count incrementing from 1 to 6 ✓
Count < 6 True for 1 to 5 ✓
Count < 6 False for 6 ✓

5.3.2  (b) Count <= 6 ✓

5.3.2  (c) Counter will be 1 larger than the real count (count will become 7) ✓
OR Average will be calculated incorrectly

5.3.2  (d) Line 1: Count = 0 ✓

5.4 Marks given for:
- Taking first index as highest or making highest = 0 ✓
- Looping through days to compare ✓
- Testing array value against highest or against value at highest index ✓
- Then Changing highest or highest index ✓

Possible algorithm solution
Take first index as highest ✓
Loop 2 to 5 (4 times) ✓
  Test array value against high index array value ✓
  Change index to new high value ✓
Display from Weekdays array the day in highIndex position

NOTE: Loop and If dependency must be clearly indicated/indented.

Possible pseudocode solution

```
highIndex ← 1
index ← 1
repeat until index = 5
  index ← index + 1
  If NumBooks[index] > NumBooks[highIndex]
    highIndex ← index
end repeat
Display from Weekdays array the day in highIndex position
```

TOTAL SECTION E: 27
SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1.1 Any TWO of: ✓ ✓
- Save paper
- Save ink/cartridges
- Easier to distribute/can send via e-mail or drop box
- Cheaper to send to many people
- Easier to store/backup/save

6.1.2 Indicates that the computer is energy efficient without sacrificing performance. ✓
OR  Device has been designed in order to use less electricity.

6.1.3 Any TWO of: ✓ ✓
- Recycle
- Use for spare parts
- Make use of companies that dispose of e-waste

6.2.1 4G is provided by cellular ✓ service providers as an extension of mobile voice service, while WiMAX is a service dedicated for Internet connection only ✓

6.2.2 Cellular data/Internet connection is in general more expensive. ✓

6.2.3 Both use radio wave / microwave transmission ✓

6.3.1 Any ONE of: ✓
- Theft of data
- Theft of hardware
- Accidental damage / deleting while working with data

6.3.2 Any TWO examples with explanations:
RAID ✓ – uses multiple disks to be able to prevent/repair data loss ✓
Backup ✓ – provides an extra copy of data to be used after data loss ✓
Anti-malware software - protects against malicious programs that may damage data
Firewall – prevents unauthorized access to local network to prevent access to, and theft of, data
Training of personnel – teaching people how to identify risks like phishing and spoofing

6.4.1 It is a small text file that is stored on your computer when you visit a website ✓ that records your use and preferences for the specific site. ✓
6.4.2 Any TWO of: ✓ ✓

- Cookies are not stored.
- Personal details not accessible.
- No record of browser history/browser history not saved
- Makes tracking of browsing patterns more difficult  (2)

6.5.1 A wiki is a collaborative ✓ reference resource where any user can make contributions. ✓  (2)

6.5.2 Any TWO of: ✓ ✓

- The administrator can moderate content before it is published
- Published content can be cross checked with other sources on web
- Request knowledgeable people to assist in moderating content
- Remove content that is not accurate
- Provide for professional peer comment on content placed on site  (2)

6.6.1 File is split into sections ✓ and shared via a number of peers ✓ instead of a server.  (2)

6.6.2 Any ONE of: ✓

- You Tube
- Streaming
- The cloud/DropBox/GoogleDrive/SkyDrive  (1)

6.7.1 The (a) key is a formula that is used to encrypt / change the information ✓ so that it cannot be read, the (a) key is used to decrypt it again after transmission ✓ and make it readable again.  (2)

6.7.2 (a) Any ONE of: ✓

- Online storage space
- Storage in the cloud  (1)

6.7.2 (b) Any TWO of: ✓ ✓

- Access on any device with Internet access
- No need for large storage capacity in devices
- Files can be accessed anywhere where Internet is available
- Easy to maintain / update material  (2)

6.8.1 Globalisation describes the increasing trend and ease with which people, goods, services and information ✓ travel around the world with the use of technology. ✓  (2)
6.8.2 Any THREE of: ✓ ✓ ✓
- Can obtain information much faster
- Access to information is not restricted to certain place, people, time/No borders
- Processing large amounts of data: Collection of data for elections/voting process
- Safety: Electronic money
- Convenience: Online banking/ATMs
- Employment: provides opportunities for skilled workers
- Tele medicine/developments in equipment
- Telecommuting

(3)

TOTAL SECTION F: 35
GRAND TOTAL: 150