

Solutions

Each answer shows the steps, then the **result**.

2.1

- back-up software: **B**
- defragmentation software: **D**
- disk formatter: **C**
- disk repair software: **F**
- file compression: **E**
- virus checker: **A**

2.2

- (a) file compression
- (b) disk contents analysis
- (c) disk formatter
- (d) virus checker

2.3 any **two** of:

- defragmentation software
- disk repair software
- disk contents analysis (frees space)

2.4

- a file whose blocks are stored in separate places on the disk, not next to each other

2.5

- a backup that copies only the files that have changed since the previous backup

2.6

- new viruses appear all the time
- the checker can only recognise the viruses whose signatures are in its database, so the database must be updated to catch new ones

3.1

(a) **defragmentation software**

- after many saves and deletes, each file's blocks are scattered across the disk, so the read/write head must move many times to read one file
- the defragmenter moves the blocks so that each file is stored contiguously, and gathers the free space together
- files are then read with fewer head movements, so they open faster

(b) an SSD has no moving read/write head, so it reads scattered blocks as fast as contiguous ones

- defragmenting only adds unnecessary writes, which wear the SSD

3.2

(a) the accounts could be lost through disk failure, accidental deletion, corruption or a ransomware attack

- back-up software copies the files to another medium on a schedule, so a copy exists and the data can be restored

(b) a full backup copies every file, which takes a long time and a lot of storage

- an incremental backup copies only the files that changed that day, so it is quick and small; a full copy once a week keeps the restore simple

(c) on a separate medium away from the computer, for example an external disk kept elsewhere or cloud storage

- so that a fire, theft or a virus on the computer does not destroy the backup as well

3.3

(a) it scans files (and memory) to detect malware

- and removes, quarantines or blocks any virus it finds before it can run and cause damage

(b) it compares the code in the file with a database of known virus **signatures** (patterns)

- a match means the file contains that virus; it also watches for suspicious behaviour

3.4

(a) **disk repair** software

- it checks the disk for bad sectors and file-system errors
- and repairs them, marking bad sectors so they are not used again

(b) the folder takes less storage and uploads and downloads faster

- 40 files are bundled into one archive, which is easier to send and to receive

3.5

(a) a **disk formatter**

- it prepares the disk for use by creating the file system (and partitions)
- so that the OS can store and find files on it; any existing data is deleted

(b) it shows the user what is using the disk space: large files, duplicates and temporary files

- so the user can delete what is not needed and free space, which also keeps the computer fast

3.6

- a utility does one occasional maintenance task, so it is not needed all the time
- keeping it as a separate program keeps the operating system smaller and simpler, and the utility can be updated or replaced on its own