1  (a) Magnetic Ink Character Reader/Optical Character Reader [1]
    (b) bar code reader [1]
    (c) Optical Mark Reader [1]
    (d) magnetic stripe reader/chip and PIN reader [1]

2  bar code reader         joystick          laser printer          multimedia projector
    PIN pad          scanner          temperature sensor          touch pad [2]

    2 correct circles – 2 marks
    1 correct circle – 1 mark

3

<table>
<thead>
<tr>
<th>statements</th>
<th>true</th>
<th>false</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer programs are examples of hardware.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A Command Line Interface is a form of operating system.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A tablet computer is larger than a desktop computer.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A compiler is an example of applications software.</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

    4 correct answers – 2 marks
    2 or 3 correct – 1 mark
    1 correct – 0 marks [2]

4

<table>
<thead>
<tr>
<th>normal</th>
<th>abnormal</th>
<th>extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>twenty</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

5  (a) Any two from:
    – hub
    – switch
    – NIC
    – bridge [2]
(b) router/modem

(c)

<table>
<thead>
<tr>
<th>Statement</th>
<th>true</th>
<th>false</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booking a theatre ticket is an example of online processing.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Producing utility bills is an example of online processing.</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>An internet browser is used by web designers to test web pages.</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>An internet browser uses an inference engine.</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

4 correct answers – 2 marks
2 or 3 correct – 1 mark
1 correct – 0 marks

6 Any three from:
- surgical and diagnostic aids
- prosthetics and medical products,
- tissue engineering
- artificial blood vessels
- designs of medical tools and equipment

7 (a) Any three from:
- Global Positioning System
- space-based navigation system
- typically four satellites must be visible to the receiver
- calculates the distance from a receiver to the satellite
- calculates the position of the receiver

(b) Any two from:
- used in cars to calculate routes
- used by walkers to locate position on hills/mountains
- used by runners to calculate distance run
- used by farmers for tractor navigation/soil evaluation/livestock control/yield monitoring
- used in satellite navigation systems for ships
- used in tracking aircraft

8 Any five from:
- both can be stored well away from the server…
- ….in the event of fire they will be secure
- tapes are cheaper per bit
- tapes are more compact than a portable hard disk for the same memory
- it is quicker to access lost work using disks
- disks would make it quicker to restore the system
- tapes are less prone to data loss and mechanical failure
- both can store very large amounts of data
- both have very fast data transfer rates
9 (a) Any two from:
- an integrated circuit...
- …which contains an aerial...
- …which receives and transmits data

(b) Any three from:
- he places his passport against the RFID reader
- he stands in front of a scanner/fingerprint scanner is used
- his facial characteristics/fingerprints are compared with...
- …those stored on the RFID chip

10 (a) Any three from:

either:
- it looks through the cells A2 to B8
- compares with the contents of E2/BB

or:
- it reads the contents of E2/BB
- compares with the contents of A2:B8
- until it finds the first matching value
- it records the corresponding value from column 2 of the range A2:B8
- E2 contains BB
- produces /records Bed and breakfast

(b) Flights only

(c) Any three from:
- it looks through the cells B12 to B22
- it adds the contents of C12 to C22 where...
- …the corresponding value of B12 to B22 is equal to E2
- there are 28 days

(d) 21

(e) INT(F2/7)

INT (1 mark)
F2/7 (1 mark)

(f) F2-(G2*7)

F2- (1 mark)
(G2*7) (1 mark)
(g) 1 mark for each correct tick

<table>
<thead>
<tr>
<th>What ifs</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queries</td>
<td></td>
</tr>
<tr>
<td>Automatic recalculation</td>
<td>✓</td>
</tr>
<tr>
<td>Internet browsing</td>
<td></td>
</tr>
<tr>
<td>Animation</td>
<td></td>
</tr>
<tr>
<td>Data replication</td>
<td>✓</td>
</tr>
<tr>
<td>Emails</td>
<td></td>
</tr>
<tr>
<td>Changing fonts</td>
<td></td>
</tr>
</tbody>
</table>

11 Any four from:
- ROM cannot be changed
- RAM can be read from and written to
- ROM is read only memory and RAM is random access memory
- ROM holds instructions that need to be unchanged, such as BIOS/program cycles in a washing machine/program instructions in games
- RAM holds the work that is currently being done by the user

12 (a) 1 mark for each correct answer

<table>
<thead>
<tr>
<th>Field name</th>
<th>Validation check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product_name</td>
<td>None</td>
</tr>
<tr>
<td>Bar_code</td>
<td>Check digit/length check</td>
</tr>
<tr>
<td>Re_order_level</td>
<td>Range check</td>
</tr>
<tr>
<td>Last_ordered_date</td>
<td>Range check/format check</td>
</tr>
</tbody>
</table>

(b) 1 mark for each correct answer
- Visual verification/checking
- Visual comparison of data entered with source document
- Double data entry
- Data is typed in twice by one typist/data is typed in by two operators and computer compares versions
(c) Any three from:
- direct changeover – new system replaces existing system immediately/overnight
- parallel running – new system runs alongside/together with existing system
- phased implementation – new system is implemented part by part
- pilot running – system is implemented in one branch/one office (at a time) [3]

13 (a) Any four from:
- data is entered using keyboard/touch screen
- uses interactive interface/asks questions...
- ...based on previous responses
- inference engine compares data
- compares data with that held in the knowledge base...
- ...using rules base
- matches are found
- system suggests probable illnesses [4]

(b) Any two from:
- Car fault diagnosis
- Prospecting
- Tax
- Careers
- Chess games
- Animal/plant classification/identification [2]

14 1 mark for each correct tick

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robots produce the same standard every time.</td>
<td>✓</td>
</tr>
<tr>
<td>Robots don’t cost very much to buy.</td>
<td></td>
</tr>
<tr>
<td>Robots don’t need programming to perform a task.</td>
<td></td>
</tr>
<tr>
<td>Robots are more accurate.</td>
<td>✓</td>
</tr>
<tr>
<td>Workers are no longer employed.</td>
<td></td>
</tr>
<tr>
<td>Robots don’t take breaks.</td>
<td>✓</td>
</tr>
<tr>
<td>Robots can think for themselves.</td>
<td></td>
</tr>
<tr>
<td>Robots never make mistakes.</td>
<td></td>
</tr>
</tbody>
</table>
15 LAN uses cables to transmit data whereas a WLAN uses wireless technology to transmit data (1 mark)

**Advantages** (2 marks)
Any two from:
- cheaper as less cabling is required
- new workstations can be sited anywhere
- different devices can be connected easily

**Disadvantages** (2 marks)
Any two from:
- limited area of network
- strength of signal is weaker
- easier to hack into/less secure
- physical obstacles can interfere with signal/can cause disconnection
- slower data transmission rates

16 (a) 1 mark for each correct answer
physical safety is the need to prevent accidents with computers
e-safety is the need to take sensible precautions when using the internet

(b) Any three from:
- only use websites recommended by teachers
- only use a student friendly search engine
- only email people already known
- think before opening an email from an unknown person
- never email the school’s name or a picture in school uniform
- know how to block and report unwanted users in chat rooms
- never give out any personal information online
- never arrange to meet anyone alone
- always tell an adult first and meet in a public place
- never use real name when playing games online

17 Any six from:
Positive:
- microprocessor controlled devices do much of the housework
- do not need to do many things manually
- do not need to be in the house when food is cooking
- do not need to be in the house when clothes are being washed
- can leave their home to go shopping/work at any time of the day
- greater social interaction/more family time
- more time to go out/more leisure time/more time to do other things/work
- are able to do other leisure activities when convenient to them
- can encourage a healthy lifestyle because of smart fridges analysing food constituents
- do not have to leave home to get fit

Negative
- can lead to unhealthy eating due to dependency on ready meals
- can lead to laziness/lack of fitness
- microprocessor controlled burglar alarm provides a sense of security
- manual household skills are lost

one mark is available for a reasoned conclusion
18 To be marked as a level of response:

**Level 3 (7–8 marks):**
Candidates will address both aspects of the question and discuss/consider different advantages/disadvantages. The issues raised will be justified. There will be a reasoned conclusion. The information will be relevant, clear, organised and presented in a structured and coherent format.

**Level 2 (4–6 marks):**
Candidates will address both aspects of the question and discuss/consider different advantages/disadvantages although development of some of the points will be limited to one side of the argument. There will be a conclusion. For the most part the information will be relevant and presented in a structured and coherent format.

**Level 1 (0–3 marks):**
Candidates may only address one side of the argument, and give basic advantages and disadvantages. Answers may be simplistic with little or no relevance.

**Examples of advantages:**
- workers can use own office so documents do not get lost in transit/bulky documents/equipment do not have to be carried around
- company can call meeting at short notice
- company does not have to pay travelling expenses
- company does not have to pay hotel expenses
- company does not have to pay for conference room facilities
- travelling time is saved
- might be dangerous to fly/travel
- disabled people may find it difficult to travel

**Examples of disadvantages:**
- takes time to train employees
- difficult to call international meetings because of time differences
- initial cost of hardware
- equipment can break down
- strength of signal/bandwidth/lipsync can be a problem/connection can be lost/power cuts
- loss of personal/social contact with other workers
- takes time for workers to learn new technology
- cannot sign legal documents [8]