1. Name the items A, B, C, D and E using the words from the list.

A: Laptop computer  
B: Speakers  
C: Inkjet printer  
D: Web cam  
E: Monitor

2. Name two media which are used to store many megabytes of data.

- Memory stick  
- Magnetic stripe

Bar code  
Floppy disc

3. Tick whether the following statements are true or false.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMR is used in a bank for reading cheques</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Bar code readers are used at point of sales terminals</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sensors are used in a computerised weather station</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cash machines use on-line processing</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

4. Draw five lines on the diagram to match the hardware to what it would be used for.

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical mark reader</td>
<td>printing out car designs</td>
</tr>
<tr>
<td>Plotter</td>
<td>reading information from credit cards</td>
</tr>
<tr>
<td>Magnetic stripe reader</td>
<td>choosing from a set of options</td>
</tr>
<tr>
<td>Touch screen</td>
<td>making backup copies of data</td>
</tr>
<tr>
<td>Zip drive</td>
<td>reading information from students' exam answers</td>
</tr>
</tbody>
</table>

[4] [5]

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
M: 01001025852
5 A local football club wants to use a computer to store all its members’ records. It wants to keep the club accounts as well as send letters to its members. Tick the three types of software it will need.

- Presentation software
- Measurement software
- Database software
- Spreadsheet software
- Word processing software
- Control software

6 Complete the sentences using words from the list below.

(a) Text is read from a document directly into a computer using OCR.

(b) One item can be accessed from a magnetic disk without reading all the preceding items. This is called direct access.

(c) An item of hardware which is connected to a computer so that it can read data such as temperatures is called a sensor.

7 (a) Name each type of network

(i) Ring

(ii) BUS

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
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Circle the type of network that does not need to have a modem.

Local Area Network  Wide Area Network

A floor turtle can use the following instructions:

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORWARD n</td>
<td>Move n mm forward</td>
</tr>
<tr>
<td>BACKWARD n</td>
<td>Move n mm backward</td>
</tr>
<tr>
<td>LEFT t</td>
<td>Turn left t degrees</td>
</tr>
<tr>
<td>RIGHT t</td>
<td>Turn right t degrees</td>
</tr>
<tr>
<td>PENUP</td>
<td>Lift the pen</td>
</tr>
<tr>
<td>PENDOWN</td>
<td>Lower the pen</td>
</tr>
<tr>
<td>REPEAT n</td>
<td>Repeat the following instructions n times</td>
</tr>
<tr>
<td>END REPEAT</td>
<td>Finish the REPEAT loop</td>
</tr>
</tbody>
</table>

Complete the set of instructions to draw these shapes by filling in the blank lines.

```
FORWARD 20  
RIGHT 90   
PENUP      
FORWARD 5  
PENDOWN    
FORWARD 20 OR FORWARD 20  
RIGHT 90   
FORWARD 50 
RIGHT 90   
REPEAT 2   
FORWARD 25 
RIGHT 90   
FORWARD 25 
END REPEAT
```

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
M: 01001025852
9. The owner of several mobile phone shops wants to computerise the records of the stock and customers. The systems analyst will need to find out how the existing systems work. She will need to find out how records of phones and customers are kept at the moment.
   (a) There are four ways she could find out this information. Describe in detail two of these ways.

   **Two from**
   - **Observation** 1 mark, Watching people in their work practices – 1 mark
   - **Questionnaires** 1 mark, recording of responses to questions to users about the system – 1 mark
   - **Interviews** 1 mark, face to face questions to users about the system – 1 mark
   - **Examining documents** 1 mark, looking at/through current paperwork – 1 mark

   (b) After analysing the existing system the systems analyst will design a database consisting of the customer file and the stock file. Apart from the structure of these files, describe four items that the systems analyst will need to design for the database.

   1. Data capture forms
   2. Input screens/user interface
   3. Report layouts
   4. Output screens
   5. Validation routines
   6. Queries/searches
   7. Macros

10. Using examples, describe each of these two terms.

   **On-line processing**
   - booking systems, cash machines, EFTPOS 1 mark
   - Description: input data is acted upon immediately and files updated immediately 1 mark

   **Batch processing**
   - Cheque processing, payroll, utility bills, overdue debts/overdue books reminders 1 mark
   - Description: such as data is collected altogether before being input to the system/data is processed in one go [4]
11 RAM and ROM are types of storage.
   (a) Explain the major difference between RAM and ROM.
      
      two from:
      
      ROM cannot be changed/RAM can be changed
      
      RAM can be read from and written to
      
      ROM is read only memory and RAM is random access memory
      
      ROM is non-volatile/RAM is volatile
      
      [2]

   (b) Give one way a computer uses ROM.
      
      holds instructions that computer needs to start up/boot the system
      
      holds instructions that need to be unchanged such as BIOS (Basic Input Output System)/program cycles in a washing machine
      
      holds program instructions in games such as gameboys, playstations.

      [1]

12 Pupils in a school are sitting an exam paper in IT. The IT teacher wishes to keep the results in a spreadsheet using the column headings shown below. The exam will be marked out of 60 and the pupils’ scores will be typed into the Exam Score column.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td>Form</td>
<td>Gender</td>
<td>Exam Score</td>
<td>Pass/Fail</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   (a) The teacher wants to use a validation check which only allows numbers between 0 and 60 to be typed in. What is the name of this type of validation check?

   range check

   [1]

   (b) She types in the following exam scores to test that the validation works:

   0, 45, 60 and 87.

   Using the data above write down one example of:

   (i) normal data

   0, 45, 60

   (ii) extreme data

   0, 60

   (iii) abnormal data

   87

   [3]
(c) The teacher decides that the pass mark for the exam should be 35. Depending on the number of marks each pupil gets, the word ‘Pass’ or the word ‘Fail’ will appear in the Pass/Fail column.

Write down the formula which should appear in cell E2.

\[=\text{if}(d2<35,\text{"Fail"},\text{"Pass"})\]

or

\[=\text{if}(d2>=35,\text{"Pass"},\text{"Fail"})\]

She wants to repeat the formula for 30 cells below E2. She does not want to type in 30 formulae. What is the best way for her to do it?

1. Highlight e2 to e32 – 1 mark
2. Click on fill down – 1 mark
3. OR
4. Highlight e2 and show fill handle – 1 mark
5. Drag down to e32 – 1 mark
6. OR
7. Highlight e2 and click on copy – 1 mark
8. Highlight e3 to e32 and click on paste – 1 mark

(d) Spreadsheets are also used to model situations such as financial planning. Tick which piece of software is the best for doing the following things:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Spreadsheet</th>
<th>Word processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making predictions</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Storing numeric data</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Writing reports</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Sorting data using several criteria</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

(e) Give two reasons why computer models are used rather than the real thing.

1. Two from:
   - Real thing may be too dangerous

2. Or
   - Real thing may be too large a time scale required
   - Wasteful of materials/too expensive to build
   - It’s easier to alter/amend/change in a model
13. A hospital's intensive care department uses a computer to monitor patients' conditions.

(a) Analogue temperature and heart monitor sensors are used. Explain why computers are unable to read the data directly from these sensors.

- Computers work with digital data 1 mark
- Analogue data must be converted into data which the computer can understand 1 mark

(b) What device is needed to enable the computer to read the data?

Analogue to digital converter/ADC

(c) Give two advantages of using a computer to collect the data rather than having it done by nurses.

1. Computer readings are more accurate.
2. Readings can be taken more frequently/continuously.
   - Nurses can get tired and forget to take readings.
   - Nurses are so busy they might not be able to take readings regularly.
   - Up to date readings.

14. (a) A company searches for minerals. They use an expert system to help them to predict which minerals are present. Describe how this expert system would be used.

- Input screen asking for soil sample details
- Sample details are typed in
- Expert system compares them with those in the knowledge base
- Using inference engine
- Percentage probability is suggested for each mineral
- User makes decisions based on output

(b) Name two other applications which involve the use of expert systems.

1. Car fault diagnosis
   - Medical diagnosis
2. Tax
   - Chess games
   - Animal/Plant identification
   - Weather forecasting

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
M: 01001025852
15 Pupil records are kept on a computer in the head teacher’s office. It is **not** connected to a network of any description.

(a) Occasionally, a pupil’s record will need to be altered. In order to do this efficiently, individual records have to be retrieved straight away.

(i) What form of file access is this called?

- direct/random access

(ii) What type of magnetic medium allows this type of access?

- hard/floppy disc/zip disc/jaz disc

(b) Give **two** occasions when a pupil’s record will need to be altered.

1. pupil changes phone number
   pupil changes address
   pupil changes form/year/grade
   medical history changes

2. pupil gains qualifications
   pupil leaves school

(c) Pupils are worried that their personal data could be misused. Name **two** things the head teacher could do to make sure that the personal data is kept secure.

1. put password on computer
   put password on file
   lock office door when not in use
   encrypt data

2. stores data on removable medium/device/removes data to secure location

(d) The head teacher needs to keep a backup copy of the data. Describe what is meant by a backup and why it is needed.

- A copy of file(s)/data
- stored on alternative medium/in a separate room
- to be used in case original is corrupted
16 An international bank has a website. It allows customers to transfer money from one account to another and pay bills.

(a) Name **two** items of information that customers would have to type in before the system will let them use it.

1. user id/account number **1 mark**
2. password/PIN

(b) Give **two** advantages to the customer of using this method rather than visiting a branch of the bank.

1. Don’t have to waste time travelling long distances to banks.
2. Don’t have to spend money on travelling expenses travelling long distances to banks.
3. No embarrassment of having to ask for loans face to face.
4. Can bank when banks are closed.
5. Personal security reasons.
6. People with disabilities find it easier

(c) Give **two** advantages to the bank of using this method rather than the customer visiting a branch of the bank.

1. fewer cashiers needed – less spent on wages
2. fewer branch offices needed – less spent on rates/rent
3. less actual cash handled – fewer robberies

(d) To prevent the customers’ bank details from being intercepted by hackers, the bank uses encryption. Explain what is meant by encryption.

use of encryption key
encoding of data
so that data is unintelligible
needs translating using a special key

(e) Describe **two** problems which might arise from the customer using the Internet at home.

   - Lose personal touch.
   - Less opportunity for socialising with friends/neighbours.
   - More expensive phone bills.
   - Lack of exercise.
2. Might not be able to use the phone if Internet is dialup.
   - Might be domestic disputes over whose turn it is to use the Internet.
17 Noreen Patel owns several book shops around the country. She wants to keep details of each book on a computer database. All the details of each book will be typed into a screen input form.

Design a screen input form which could be used for typing in one book’s details.

| ISBN: [..............................] |
| Reference number: [..............................] |
| Branch number: [......................] |
| Book Title: [........................................................................... ] |
| Author’s name: [........................................................................... ] |
| Publisher: [.......................................................... ] |
| Dewey number: [.....] |
| genre: [.......................................................... ] |
| Target age group: [.........] |
| date published: [...../...../......] |
| summary of contents: [........................................................................... ] |
| Selling price: [......................] |
| Cost price: [......................] |
| no. of copies: [..........] |

18 A supermarket uses EFTPOS terminals. When goods are bought, the product numbers of the goods and the customer’s bank card number are input.

(a) What input devices are used to input:

(i) the product numbers of the goods bought?

- barcode reader/keyboard

(ii) the customer’s bank card number?

- magnetic stripe reader/Chip reader/smart card reader/keypad

(b) The supermarket’s stock file contains information like this.

<table>
<thead>
<tr>
<th>Product number</th>
<th>Product name</th>
<th>Number in Stock</th>
<th>Re-order level</th>
<th>Re-order quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>002136987421</td>
<td>Oatabix</td>
<td>163</td>
<td>150</td>
<td>400</td>
</tr>
<tr>
<td>001467326581</td>
<td>Brick bat tea</td>
<td>135</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>002145326891</td>
<td>Mines baked beans</td>
<td>243</td>
<td>195</td>
<td>600</td>
</tr>
</tbody>
</table>
Describe the computer processing involved in updating the stock file every time a packet of Oatabix is sold and how the computer would know when it is time to order some more. Include in your answer any checks that take place on the input data.

- product number is validated
- using check digit
- product number is compared with each item
- a match would be made with 002136987421
- number in stock is reduced by 1
- 163 becomes 162
- number in stock/162 is compared with...
- ...is compared with re-order level 150
- if equal then needs re-ordering

(c) Describe the computer processing involved in taking payment from the customer’s bank account including any checks that are made.

- PIN is checked
- supermarket computer contacts bank computer
- using sort code present on card
- expiry date check carried out on card
- existence check carried out on card/account number
- matching account details looked up on file
- balance/credit check is carried out on account
- if available funds present money is deducted from account and added to supermarket bank account transferred from customer account to supermarket account

19 A school’s football team have been producing some excellent results. The team captain has been asked to produce a multimedia presentation for the head teacher to use in an assembly.

(a) Describe two methods that he could use to obtain images for the presentation.

1. take photos using a digital camera – 1 mark
   download from camera and save – 1 mark
   OR
   take photos using traditional camera – 1 mark
   scan the developed photo/develop onto CD ROM and save – 1 mark
   OR
   find images on the Internet – 1 mark
   copy and paste/download images – 1 mark

2. find appropriate images of Clipart – 1 mark
   copy and paste/download images from a CD ROM – 1 mark
   OR
   use of art/drawing package – 1 mark
   scan images – 1 mark
   save image – 1 mark

(b) He stores the images on the computer’s hard disc. He closes all applications and opens the presentation software. Describe how he will produce the multimedia presentation using these images, sound and text.

- create new slide
- import/insert/copy and paste images
- insert sound file
- create text box
- type in text (in text box)
Many schools are encouraging teachers and students to use the Internet to improve teaching and learning. Is this a good thing or a bad thing? Discuss this development giving the advantages and the disadvantages to students, teachers and the school.

pupils:

advantages: much wider source of knowledge
up to date information
better quality diagrams/charts
easier to find relevant information
(use of emails) so no need to carry bags

disadvantages: can easily get sidetracked looking at irrelevant sites
can be lured into plagiarism
need to acquire skills in searching techniques

teachers:

advantages: can set more demanding tasks
can have work emailed to them
work is more presentable – easier to mark
pupils find learning more interesting
more interesting resources available

disadvantages: difficult to know if it is the pupil’s own work
too many emails can overload teacher and/or system
viruses can cause system to break down

school:

advantages: pupils more motivated – better exam results
pupils more motivated – better school environment

disadvantages: pupils may access unsavoury sites
pupils may download coursework
expense of networking/ISP rentals
expense of phone bills

(one mark for reasoned conclusion)