This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the March 2016 series for most Cambridge IGCSE® and Cambridge International A and AS Level components.
1  (a)  Laser
    Fast output for large volume jobs/high quality printout [1]
    For sending communications to suppliers in order to give a good impression/letters to loyalty card holders/flyers/bar codes of products/to print out daily sales figures/invoices [1]

    Inkjet
    High quality, glossy colour printouts/cheaper to run than colour laser printer [1]
    To print out posters/information to customers about special offers [1]

    Dot matrix
    They produce multiple copies simultaneously/can print continuously [1]
    Used to print out orders to suppliers so that different copies can be stored in different departments (accounts/manager/grocery)/print payslips/receipts at checkouts [1]

(b)  (i)  Examination of documents
    Looking through technical and user documentation about the current system/documents produced by current system/two of checkout receipts/payslips/order forms/invoices [1]
    Find out information about transaction types and goods on sale/to study what data is collected and what information is output/to identify inputs and outputs of the system [1]

(ii)  Questionnaires
    Asking users of the current system questions about the current system in the form of hard copy/complete form on paper/on-screen [1]
    Collect data directly from a large number of system users [1]

(iii)  Interviews
    Asking users of the current system questions about the current system face to face/in person [1]
    To get more in depth answers from management/users of current system regarding the current system/eliciting answers by asking follow up questions dependent on the replies given [1]
(c) Six from:

Systems documentation:
- A detailed overview of the whole system
- What is expected of the system/purpose of the system
- Data Flow Diagrams/systems flowcharts
- The results of systems analysis
- Test plan and test results
- Overall design decisions…
  …the choice of hardware and software
  …file, input and output structures
- Systems flowcharts

Program documentation:
- Description of the software/purpose of the software
- What the software does and its features
- Program listing - a complete copy of the code used
- Annotation explaining what each module of code does
- Reasons for choosing those pieces of existing software that were used instead of the programmer having to write code
- Input and output data formats
- Program flowcharts/algorithms
- Notes that will help any future programmer to make modifications to the system

2 (a) Three pairs of answers from:

Afraid that a lot of staff will see customers' personal information and that it will become public knowledge/given to the wrong sort of people
Explain that access to the information is restricted to just a few staff/staff are trustworthy and know their responsibilities to the customer

Afraid that the information may be passed on to other organisations
Explain that the information is covered by the data protection legislation which forbids the handing on of data to unauthorised third parties/explain the systems in place to protect the data/limited amount of data will be collected

Because they do not trust the information held to be accurate
Allow the customer to view the information held about them

Customers may intend to use the new online shopping method only, which may not allow them to scan loyalty cards
Amend the online shopping system to enable customers to type in their loyalty card number/enable it to be scanned by delivery driver

Might think they have to pay for the loyalty card
Explain that the card is free to obtain

Might not be aware of the scheme
Produce posters/flyers/web site ads publicising the scheme

Thief could steal their card and use their discounts
Introduce a PIN system
(b) Six from:

Sales reports can be used
Can see what products are selling well/poorly/popular/unpopular…
This leads to ordering more/fewer of those products
Can offer discounts on poorly selling products
Future ordering can be based on past sales
Can order immediately if out of stock
Can ensure stock never runs out
Reports on customer spending habits via analysis of till receipts/loyalty cards
Based on customer spending habits target marketing/vouchers sent to specific customers
Business performance management to indicate where investment may be needed
Individual checkout operators have their performance measured
Can determine training needs for specific workers
Can identify individual departments which are not performing as well as others
Predictions can be made for budgeting over future years
Payroll reports can be produced to ensure total salaries paid is affordable

3 (a) (i) Two from:

Reduces the size of the file
File will take up less storage space on the manager’s computer
Means that the file arrives more quickly than it otherwise would

(ii) Three from:

Use comments which do not alter the document
Johannus can then amend or reject comments as appropriate
Comments can be in different colours/forms to indicate importance of change
Use of comments/titles in headers and footers to establish version
Use of text highlighting to show amendments

(b) Three from:

Printed in grey scale
Draft quality should not be used
Care must be taken when drawing graphs to choose colours/patterns that will be distinguishable in grey scale
The chart should be large enough for all parts to be seen when it is printed/not distorted by fitting to a page
(c) (i) **Three** from:

- Film negatives are produced from digital files
- (Ultraviolet) light is allowed to pass through the film negatives...
- ...to expose the printing plate
- Design is produced on computer system (using suitable software)
- Design etched by producing ‘spots’ on plate...
- ...density of/sizes of spots determine the resolution of etching
- Precise nature of etching allows for halftones to be produced
- Aluminium plate is bent around the plate cylinder
- Plate cylinder has ink directed onto it
- Rotates against blanket cylinder forming an image
- As blanket cylinder rotates it presses against the paper causing the image to be printed
- Impression cylinder just presses paper against the blanket cylinder

[3]

(ii) **Four** from:

- Improved print quality
- Plates are more consistent which helps re-printing/plates identical every time they are produced
- Production of plates is much quicker
- Easier to amend magazine prior to printing/no need to produce plates until final print
- Cheaper as fewer plates need to be produced
- Safer because it reduces the use of hazardous chemicals/reduces volume of waste materials produced

[4]

4 (a)  

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyre_ID</td>
<td>Text/alphanumeric</td>
</tr>
<tr>
<td>Price</td>
<td>Numeric, currency</td>
</tr>
<tr>
<td>No_In_Stock</td>
<td>Numeric, integer</td>
</tr>
<tr>
<td>Mix</td>
<td>Boolean</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Text/alphanumeric</td>
</tr>
</tbody>
</table>

5 correct answers – **3 marks**  
4 correct answers – **2 marks**  
3 correct answers – **1 mark**  
1 or 2 correct answers – **0 marks**
(b) (i) To ensure data is copied accurately from one medium to another

Two from:

Visual verification
Visually compare data on screen/printout with original/source document
Double data entry
Two people type in data/one person types in data twice
Computer compares two versions
Keyboard freezes/sound made/data flagged if differences occur
Decide which version is correct if differences are spotted

(ii) Three from:

Validation is to make sure that data entered is sensible for that field
Tyre_ID field would be subject to a format check/input mask to ensure it consists of two letters followed by three digits
Price field would be subject to a range check of...(any sensible range of rupees)

5 (a) Two from:

Cameras to inspect the tyre
Grippers to pick up tyre
Spanners to unlock/tighten nuts on wheel

(b) Four from:

There are lower running costs/no need to pay robot’s wages
Work/work rate is of a consistent standard
NWTyre is now in a position to offer a 24/7 service
It is a safer/less dangerous environment for humans
Greater productivity

6 (a) Six from:

Has a limited menu so all the options can be clearly shown on a single screen
The use of a touchscreen will reduce the number of input errors compared to using a keyboard
Selecting an item on screen is easier than controlling a mouse
Entry of data is quicker than with a keyboard/mouse
Needs less room than a screen and keyboard/mouse
Amount of training required is less than with other devices
Touchscreen is more robust than keyboard/mouse for use in greasy/dirty conditions
More suitable for disabled cashiers
(b) **Six** from:

Decides whether a supplier should be contacted…
… if so, gives the name of the supplier
Uses the IF function to compare the number of items in stock/contents of B2 with the minimum stock level/contents of C2…
…and if lower, displays the supplier name/contents of H2
… if not, lower it displays “No order”

VLOOKUP is used to search the lookup table of suppliers/G2:H4
A match to the value in cell D2 is searched for in column G

Needs to be an exact match because of the ‘FALSE’ part of the formula

The ‘2’ instructs that when a match is made then the appropriate value is read from the second column/column H of the lookup table

The $ is used to ensure that the references to the lookup table/G2:H4 are maintained when the formula is replicated

[6]

(c) **Eight** from:

Coils of tubing filled with a refrigerant…
… one coil is inside the room and the other is outside

Compressor converts cool low-pressure gas into hot high-pressure gas
The gas flows to a condensing unit outside the building
Condensing unit allows refrigerant to cool/cool gas to form liquid
Back in the building it passes through a valve…
… which causes the liquid to evaporate into cold low-pressure gas

Evaporating unit is situated inside the restaurant…
… absorbs heat from surrounds thereby cooling restaurant

Correctly positioned evaporating unit described/shown on diagram
Correctly positioned condensing unit described/shown on diagram
Correctly positioned valve described/shown on a diagram
Correctly positioned compressor described/shown on diagram
Correct indication of warm air described/shown on a diagram
Correct indication of cold air described/shown on a diagram

6 max if no diagram

![Diagram of air conditioning system](attachment:image.png)