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1 (a) [1]

<table>
<thead>
<tr>
<th>Function</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converts cool low-pressure gas into hot high-pressure gas</td>
<td>✓</td>
</tr>
<tr>
<td>Causes the liquid to evaporate into cold low-pressure gas</td>
<td></td>
</tr>
<tr>
<td>Monitors the pressure of the refrigerant</td>
<td></td>
</tr>
<tr>
<td>Is essentially situated outside the building</td>
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(b) [1]

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2

| Keeping a constant temperature for the printing presses is an example of batch process control. |
| Batch process control is used to produce extremely large amounts of product per year. |
| Discrete process control is like an on/off or stop/start process ✓ |
| The production of the rolls of paper is an example of continuous process control ✓ |
| Continuous process control is used to produce relatively small amounts of product per year. |
| There are four types of process control |
| A PLC could be used to control the temperature for the printing presses ✓ |
| Microprocessors are not used in any aspect of process control |
| Continuous process control is used in processes which appear to be unending ✓ |
| Discrete process control is when the process is hidden |

3 (a) **Three** from: [3]

- Programmable logic controller
  - A type of microprocessor/computer/microcomputer
  - Used for a single purpose
  - Can accept both analogue and digital inputs
  - Uses a set of logic statements
  - Compares input with a pre-set value
  - Activates output devices/actuator
  - Normally programmed to operate a machine/system using just one program
  - Used in systems where pre-set value is constant

(b) **Three** from: [3]

- It’s a proportional–integral–derivative algorithm
- Used when preset value is a constant
- PID causes the PLC to make proportional changes
- PID calculates difference between the input value and the preset value
- Causes PLC to make proportional changes to the output
- PID checks the difference again
- Until preset value is reached
4  (a) Three from:  

Reporters types up/edits their story using word-processing software/DTP
Reporters types up/edits their story using laptop/keyboard
Takes photographs using a digital camera/phone
Import images from digital camera/phone
Edit images using picture/image editing software

(b) Three from:  

Correct font (type) has to be chosen
Correct font size has to be chosen
Kerning to (adjust the space between individual letters in word)
Amend the leading (- the space between lines on a page)

(c) Two from:  

(Digital) signals are used to send the pages up to a satellite
Transmitted by the satellite to the printing plant/presses

5  (a) WIMBA
Business
Advertising of a single company + example  

Insurance
Service
Advertising of services such as government/tourism/banking  

New car model
Product
Advertising of a specific product + example

(b) Two from:  

Video of the car/company could be imported from video camera/ digital camera
Vocal introduction to company could be input using microphone

(c) Four from:  

pop ups from the other company’s site may create unhappy customers who may avoid that company in future/will have poor impression of the company/will tend to ignore them
Customers will use pop-up blocking (software) which does not allow their advertising on other company’s website to appear
Can make their own website better suited to their needs
Own website has shorter delay in updating/improving advertising
Company has more control over its own website than it would over the host’s website
May be so many other companies’ advertising on host website the company’s may not be seen/not as much advertising can be used/limited space available

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(d) Four from: [4]

Pop-ups are small windows which suddenly appear in front of the web page user is working on/popup-unders are small windows placed underneath the web page user is working on. Pop-up instantly grabs the attention of the customer/Pop-unders don't appear to users until they close the page they are working on. Pop-unders are not removed by pop-up blocking/popup ups are blocked by pop up blocking software.

The customer regards pop-unders as less of an inconvenience than pop-ups.

6 (a) Four from: [4]

Flexible hours refer to hours that are worked whereas compressed hours refer to days that are worked.
Flexible hours give workers some choice about what times of each day they work.
Flexible hours can vary from day to day.
Compressed hours would be fixed for those days which were being worked fully.
Workers work the same number of hours each week with flexible hours.
If compressed hours were spread over two weeks, would work more hours one week than the next.

(b) Two from: [2]

Allows workers to organise their working lives to suit their personal needs.
Can choose to work off-peak hours as travelling to work outside peak times is easier and cheaper.
If workers stay late to finish a job, they can take time off at a later date.
If the job requires great concentration, it can be done at quiet times of day.

(c) Two from: [2]

Can match working hours with busy and not-so-busy times.
Easier to allow for workers' personal needs which leads to a reduction in absenteeism/improved punctuality.
Working flexitime hours would appeal to many technicians so it helps recruitment/reduces the number of staff leaving for another job.
Reduces the need for training new staff.
Working flexitime hours is popular leading to greater productivity.
7  (a) **One** pair from:

- Assembling of car body, painting of car body
- Assembling of car body, fitting of chassis
- Assembling of car body, road testing the finished car
- Assembling the chassis, painting of car body
- Assembling the chassis, fitting of chassis
- Assembling the chassis, road testing the finished car
- Assembling of car engine, painting of car body
- Assembling of car engine, fitting of chassis
- Assembling of car engine, road testing the finished car
- Painting of car body, fitting of chassis
- Quality control, road testing the finished car
- Painting of car body, road testing the finished car
- Fitting of chassis, road testing the finished car

(b) **One** pair from:

- Quality control with any activity except road testing

Or **two** of:

- Assembling of car body
- Assembling the chassis
- Assembling of car engine

(c) **Four** from:

- Assembling the chassis, assembling of car engine are not affected
- Painting of car body will now start at 0600/finish at 1200/delayed by six hours
- Fitting of chassis will now start at 1200/finish at 1800/delayed by six hours
- Quality control will be extended to 1800/extended by six hours
- Road testing will now start at 1800/finish at 1900/delayed by six hours

8  **Four** from:

- Requires a dedicated telephony server
- The operator's phone communicates directly with the server
- The server controls all the phones
- Operator's phone is not directly connected to their computer
- Any computer in the system can be used to control any phone
- The server controls all the phones
- Allow supervisors, for example, to intervene if the call proves too complex for the operator to handle
- (The server) can direct a call to the appropriate operator
- Suitable for large call centres
9 (a) Four from:

Card number
Expiry date
Name (as shown on card)
Card Security Code
Address

(b) Four from:

At the end of each billing period
Transaction file is sorted into same order as master file
Sorted on customer number
First record in the transaction file is read
First record in the old master file is read
If it matches, transaction is carried out
If records don't match, computer writes master file record to new master file
Computer calculates the bill
Using cost of units from master file
Using units used from transaction file
Processed record is written to new master file
Bill is printed
Process is repeated until end of old master file

10 (a) Two from:

Magnetic tape has serial access and the files would be sequential/batch processing required
Tapes have a greater longevity than most other media
Tapes are cheaper per unit of memory

(b) Amendment
Customers' details change
Addition
New customer
Deletion
Customer closes account/dies
11 (a) Data flow diagram
   Using (two from :) terminators, processes, flow arrows and stores
   The diagram would represent inputs, outputs and processing

   System flowcharts
   Using particular input, output, storage and processing symbols
   The diagram would represent inputs, outputs and processing (only if not given for DFDs)

(b) Two from:
   (Use of live/normal data) such as a number between 0 and 16000 for the bill
   (Use of live/normal data) such as a customer number which is exactly 12 characters
   (Use of live/normal data) such as a customer number which is digits only
   This data should be accepted by the system

   Two from:
   (Use of abnormal data) such as 16001 or “sixteen thousand”
   (Use of abnormal data) such as a customer number which is less than or greater than 12 characters
   (Use of abnormal) such as a customer number which contains text
   This data should be rejected by the system

   Two from:
   (Use extreme data) such as 0 or 16000 for the customer bill
   This data should be accepted by the system

(c) Three from:
   Amend rule to ensure the acceptable value for the bill is >= and <= and not just > and <
   Amend rule to ensure that it uses 0 to 16000
   Amend rule to ensure it checks it is numeric
   Amend rule to make sure < has not been used instead of > and vice versa
   Amend rule to ensure length check is 12 exactly
   Field descriptions are included which adequately inform about field contents