References

- Cannibal\Classes\GARCIA\INEN416\Components of Decision Support System\Section Descriptions

Section I Points Distribution

- **Section I**
  - Parts Drawings: 30
  - Parts List: 15
  - Assembly Flowchart: 30 (process sequence analysis)
  - Assembly Drawing: 10
  - Report writing: 15
Minimum Expectations

1. Each member >= 2 parts drawings
2. In case of variants: Drawings for basic configuration in detail & add-on’s in finished drawing format is OK
3. Engineering Drawing should show....
   - Front View/Side View/Top View (if necessary)
   - Dimensions (l, w, h, diameter/radius) of each view of the part
   - Include dimensions Center lines & Hidden lines
   - Tolerances
   - Materials
   - Finishes
   - Company Name/Part Name/Name of Team Member/Scale/Drawing #
4. Describe the purpose of the parts list and also the original numbering system created by your company

Parts List

Include the following information:
- Item – Ascending Order (1,2,3,….n)
- Drawing Number – Refers to the Production Drawing
- Part# - Create a number system that categorizes the parts. Fully describe this system and the logic behind it in the introduction.
- Description – Name or description of the part
- Quantity – Number of units of this part needed for final assembly
- Material – Type of material the part is composed of
- Weight – Weight of the part/Dimensions if necessary
- M/B – M=Make B=Buy
Format for Parts list

PARTS LIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>MATERIAL</th>
<th>WEIGHT</th>
<th>M/B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

WRITE PRODUCT NAME HERE

Assembly Flowchart

- Discuss the importance and attributes of this section. Describe the “flow” of your assembly flowchart and any assumptions you made during its construction.
Assembly Flow Chart

A. Include the following:
- Part Name
- Item #
- Subassemblies
- Assemblies
- Inspections
- Company Name

B. Use the following symbols:
- Circle – Assembly (A1, A2, ..., An)
- Square – Inspection (I1, I2, ..., In)
- Circle – Sub-Assemblies (SA1, SA2, ..., SAn)

Flow chart symbols

Item #

Part Name

SA or A

Inspection

Part Name
Section II Points Distribution

- **Section II**
  - Route Sheets: 20
  - Machine Drawings: 20
  - Material Requirement/Cost: 15
  - Machine Requirement/Cost: 15
  - Scrap/Sample Calculations: 15
  - Report writing: 15

**Route Sheet** (refer to folder for format)

Include the following information on the route sheets:
- Part name & number (part description and part number from the parts list)
- Drawing number and lot size
- Date
- Team Member who completed the Route Sheet
- Operation number – serial number of the operation performed on the part
- Operation description
- Jigs, fixtures or tools required for operation – any additional equipment required besides the machine
- Machine type – name of machine required to perform the operation
- Standard time – time to perform the operation
- Machine capacity per hour – 1/(standard time)
- Material requirements (type & quantity) – must also include scrap
Sub Assy./Assy. Route sheets

- Part name & number (part description and part number from the parts list)
- Drawing number and lot size
- Operation number – serial number of the operation performed on the part
- Operation description
- Jigs, fixtures or tools required for operation – any additional equipment required besides the machine
- Machine type – name of machine required to perform the operation
- Standard time – time to perform the operation
- Machine capacity per hour – 1/(standard time)
- Material requirements (type & quantity) – must also include scrap

Manufacturing Material Requirements Table

- Part Number – Part number from the route sheet
- Part Description
- Material – Part Material
- # - Required number of units of the part
- Lbs./Unit – Part weight per unit
- SC% - Percentage of the scrap estimated in the fabrication of the part
- Req’d. Lb. – [1 + (SC%)/100] x Lb./Unit x #
- Lbs./Day – Req’d Lb. x production per day
- $/Lb. – Cost of the material per pound
- $/Unit – ($/Lb.)*(Req’d. Lb.)
- $/Year – (Req’d. Lb.)*($/Lb.)*(# of working days per year) – Yearly cost of the material to produce the required number of parts
Format for Manufacturing Material Requirement Table

WRITE PRODUCT NAME HERE

<table>
<thead>
<tr>
<th>MANUFACTURING MATERIAL REQUIREMENTS TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART #</td>
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</tbody>
</table>

Machine Costs Table

- Machine Description – Machine name, similar to the name used in machine requirements table
- No. Req’d – Number of machines required, from the machine requirements table
- Space Required – The space required by the machine, from the machine specifications
- Cost/Machine – Cost per machine
- Total Cost – Number of machines x Cost/Machine
- Annual Cost – (Total Cost – 10%*Total Cost) ÷ Service Life
Machine Requirements Table

- Machine – Name of Machine
- Part Number – Part Number from the parts list
- Operation number – Number of the operation in the route sheet where the machine is used
- Decimal machines – Number of machines needed using the following equation:
  
  Where the following notation has been used:
  
  $N = \text{number of machines}$
  
  $P = \text{daily production volume}$
  
  $t = \text{yearly production ÷ number of working days per year}$
  
  $H = \text{available time}$
  
  $s = \text{set-up time per day}$
  
  $p = \text{availability factor (as a decimal fraction)}$
Format for Machine Requirements Table

<table>
<thead>
<tr>
<th>MACHINE REQUIREMENTS TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACHINE</td>
</tr>
<tr>
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</tbody>
</table>

Machine Drawings should indicate:

- Outline of Machine (Cross-hatching of machine)
- Operator's Figure
- Work area of machine (usually 4’ around machine)
- Floor space required
- Material input-output
- Utilities required
- Clearance space
- Maintenance access
- Scrap removal
- area of machine (usually 4’ around machine)
- Dimensions of machine
Machine Drawings

- Use AutoCAD to generate your machine drawings
- Dimension all objects included in the drawing and perimeter of work space
- Position of worker
- In Box/Out Box
- Company Name
- Team Member who completed the Machine Drawing
- Date
- Scale – NTS
- Machine Description
- Machine Drawing
- Drawing Number