

# Automation Production Systems and Computer Integrated Manufacturing 4th Edition Groover Solutions Manual

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## Chapter 2 MANUFACTURING OPERATIONS

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### REVIEW QUESTIONS

2.1 What is manufacturing?

**Answer:** Two definitions are given in the text. The technological definition is the following: Manufacturing is the application of physical and chemical processes to alter the geometry, properties, and/or appearance of a given starting material to make parts or products. Manufacturing also includes the joining of multiple parts to make assembled products. The economic definition is the following: Manufacturing is the transformation of materials into items of greater value by means of one or more processing and/or assembly operations.

2.2 What are the three basic industry categories?

**Answer:** The three basic industry categories are (1) primary industries, which are those that cultivate and exploit natural resources, such as agriculture and mining; (2) secondary industries, which convert the outputs of the primary industries into products; they include manufacturing, construction, and power generation; and (3) tertiary industries, which constitute the service sector of the economy; examples include banking, retail, transportation, education, government.

2.3 What is the difference between consumer goods and capital goods?

**Answer :** Consumer goods are products that are purchased directly by consumers, such as cars, personal computers, TVs, tires, toys, and tennis rackets. Capital goods are products purchased by other companies to produce goods and supply services. Examples include commercial aircraft, mainframe computers, machine tools, railroad equipment, and construction machinery.

2.4 What is the difference between a processing operation and an assembly operation?

**Answer:** A processing operation transforms a work material from one state of completion to a more advanced state that is closer to the final desired part or product. It adds value by changing the geometry, properties, or appearance of the starting material. An assembly operation joins two or more components to create a new entity, called an assembly, subassembly, or some other term that refers to the joining process.

2.5 Name the four categories of part-shaping operations, based on the state of the starting work material.

**Answer:** The four categories are (1) solidification processes, (2) particulate processing, (3) deformation processes, and (4) material removal processes.

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**J Spring**



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