51. Material handling equipment that can follow multiple paths, move in any direction, and carry large loads of in-process inventory is most likely to be associated with a ________ layout
   a. process
   b. product
   c. fixed-position
   d. hybrid
   **(Easy)**

52. A process layout in a service firm would have
   a. narrow, small aisles and limited display spaces
   b. narrow, small aisles and ample display spaces
   c. **wide, large aisles and ample display spaces**
   d. wide, large aisles and limited display spaces
   **(Medium)**

53. A service layout that encourages customer familiarity, has low costs, and is easy to clean and keep secure is known as
   a. a free flow layout
   b. **a grid layout**
   c. a spine layout
   d. a loop layout
   **(Easy)**

54. A schematic diagram that uses weighted lines to denote location preference is known as
   a. a Muther’s grid
   b. a block diagram
   c. a unit load chart
   d. **a relationship diagram**
   **(Medium)**

55. The process of equalizing the amount of work at each workstation in a product layout is known as
   a. block diagramming
   b. precedence requirements
   c. **line balancing**
   d. cycle time analysis
   **(Easy)**

56. Precedence requirements specify
   a. the cycle time and flow time requirements
   b. **the physical restrictions on the order in which operations are performed**
   c. the bottleneck and output objectives
   d. the efficiency and balance delay
   **(Easy)**
69. An assembly line consists of three workstations (WS) with each station’s activity time as shown.

When fully operational the maximum output for this line in 8 hours of production time would be

- a. 40 units
- b. **96 units**
- c. 120 units
- d. 160 units

*(Hard)*

70. An assembly line consists of three workstations (WS) with each station’s activity time as shown.

If the line currently assembles 10 units every hour when fully functional, then the line’s balance delay at this rate of output would be

- a. 66.67%
- b. **33.33%**
- c. 80.00%
- d. 20.00%

*(Hard)*

71. An assembly line consists of three workstations (WS) with each station’s activity time as shown.

The flow time for items on this line would be

- a. **15 minutes**
- b. 5 minutes
- c. 4 minutes
- d. 3 minutes

*(Medium)*