**Additional Unit # 4 problems – Bozarth**

**1**. Billy’s Hamburger Barn has a single drive-up window. Currently there is one attendant at the window who takes the order (30-40 seconds), gathers up the food and bags it (30-120 seconds), and then takes the customer’s money (30-40 seconds) before handing the food to the customer.

**a)** Map the current process. What is the minimum cycle time? The longest cycle time?

**b)** Suppose Billy’s Hamburger Barn redesigns the process so there are now two attendants. The first attendant takes the order. Once this step is finished, the first attendant then takes the money, and the second attendant gathers up and bags the food. If two of the process steps can now be run in parallel (gathering the food and taking the money), what is the new minimum cycle time? What is the longest cycle time? What potential problems could arise by splitting the process across two individuals?

**9**. When a traveller enters the passport office to have his passport renewed, he spends on average, 45 minutes in line, 2 minutes having his eyes tested, and 3 minutes to have his picture taken. What is the percent value-added time? Explain any assumptions you made in coming up with your answer.

10. Average waiting times and ride times for two of Dizzy World’s rides are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ride** | **Average waiting Time** | **Length of Ride** | **Total Process Time** |
| Magical Mushroom | 30 minutes | 10 minutes | 40 minutes |
| Haunted Roller Coaster | 40 minutes | 5 minutes | 45 minutes |

**a)** Calculate the percent value-added time for each ride. Calculate the percent value-added time for the total process.

**b)** Now suppose Dizzy World puts in place a reservation system for the Haunted Roller Coaster ride. Here’s how it works: The customer receives a coupon that allows him to come back in 40 minutes and immediately go to the front of the line. In the meantime, the customer can wait in line and then ride the Magical Mushroom. Under this new system, what is the customer’s total waiting time? Total riding time? What is the new percent value added time?