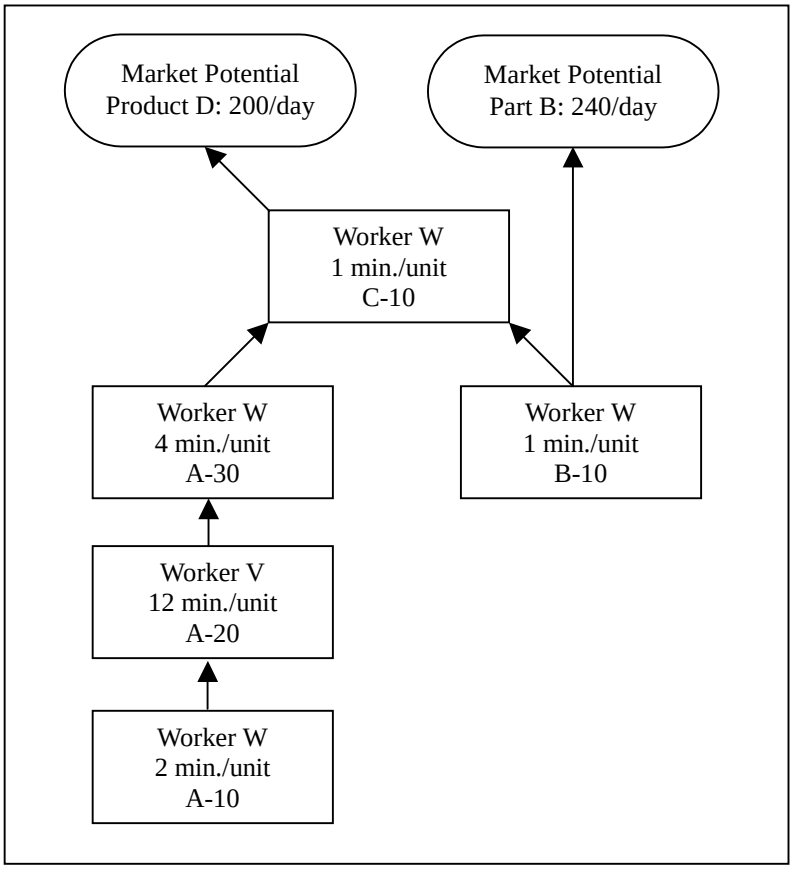
請將答案與計算過程寫於答案卷上，勿寫於題目卷上。

1. (15%) Two workers are engaged in production of a product D and its spare part B. The resources required, rates of production, operational steps, and market potentials (demands) are given in the diagram. There is only one Worker V and one Worker W per shift. The plant operates 24 hours a day (3 shifts), 5 days a week. The workers cannot substitute for each other and there is no other work except as detailed in the diagram.



(a) What is the maximum units of product D can they produce per day?

(b) Buy minimizing the overall inventory while satisfying the demand as much as possible using the Theory of Constraint principle, how many hours should Worker W work per day?

(c) If Worker V works 24 hours at A-20 per day while Worker W works at A-10 (6 hours), A-30 (8 hours), B-10 (8 hours), and C-10 (2 hours) per day, estimate inventory accumulation (in units) after one day at B-10.

2. (10%) Weekly demand for 12" frames at the Frame Shop is normally distributed with a mean of 250 and a standard deviation of 150. The store manager has decided to follow a periodic review policy to manage inventory of cell phones. They plan to order every three weeks. The manufacturer currently takes two weeks to fill an order. The desired CSL (cycle-service level) is 95 percent ($F_s^{-1}(0.95)=1.646$).
   (a) Safety inventory, *ss* = ?
   (b) Their target inventory: *T* = ?

3. (10%) Weekly demand for product X is normally distributed with a mean of 300 and a standard deviation of 180. The store manager continuously monitors inventory and currently orders 1,000 units of products X each time the inventory drops to *ROP* (reorder point) level. Assume a CSL (cycle-service level) of 78.4 percent (i.e. $F_s^{-1}(CSL) = 0.785674$).
   (a) If supply lead time is 2 weeks, then safety inventory: *ss* = ?
   (b) If supply lead time is 2 weeks, then reorder point: *ROP* = ?

4. (15%) Describe the conceptual framework of e-business. How do the concepts of ERP, CRM and SCM fit into this framework?

5. What is S-curve? For a specific technology A, what is its technological trajectory? (3%) If a new technology B is emerging to replace technology A, please draw a diagram to illustrate when the technology substitution phenomenon will occur? (3%) For the leading firm in technology A, how should it deal with the current technology A and the emerging technology B respectively? Please describe your proposal and the underlying assumptions. (9%)

6. Please describe the stages of the new product development process? (5%) What are the major problems that cause the high failure rate of new product development? (5%) How can firms overcome these problems during the process of new product development? (5%)

7. Please compare the sustainable and disruptive innovation strategies in terms of product functions, targeted customers, and business model. (10%) What should firms do to incubate the disruptive technological innovations? Please discuss at least in terms of strategy formulation, resource allocation process, organizational structure, and capital utilization. (10%)