commerce
undergraduate
society

(COMM 204) REVIEW SESSION

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CMP

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I. (Basic Information)

1. Which one of the following options is wrong?
   A. Strategic fit means that where a company's location itself on the Operations Frontier depends on a company's strategy of development.
   B. Tactical issues are ensuring that the firm is on the operation frontier
   C. Moving the Operations Frontier means there is a operations innovation.
   D. None of the above.

II. (Process Analysis)

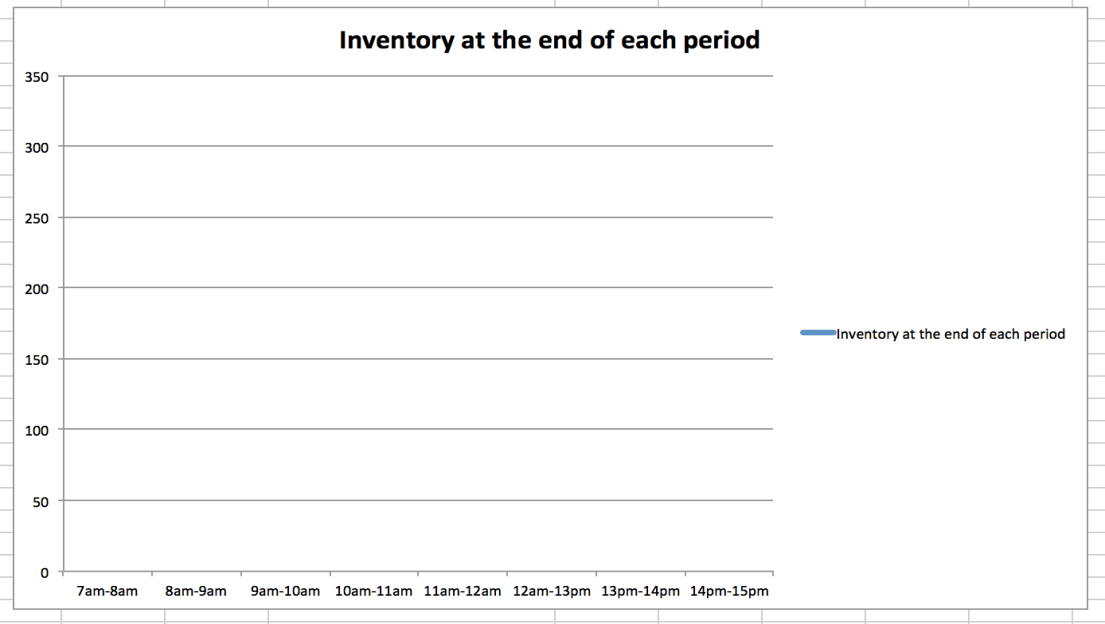
2. What does it mean that no resources are at capacity?
3. What does it mean by a process being blocked or starved?
4. Suppose we are producing Pokémon Balls, this production process consists of four tasks. Tasks A and B are in parallel, that is, task A and B can be carried out simultaneously. After both A and B are completed, the flow unit will be processed by task C and task D sequentially. The following table shows resources and unit loads for each activity. Note that to increase the process capacity, two workers, doing exactly the same task, work in parallel on task D. Each worker is only able to perform one task.

	Resources	Unit loads
Task A	one worker	10 minutes per unit
Task B	one worker	12 minutes per unit
Task C	one worker	15 minutes per unit
Task D	two workers in parallel	20 minutes per unit per worker

   a. Draw the process map for the above process.
   b. What's the capacity of this process? What is the bottleneck? If this production system produced on average 3 units per hour last year, what was the utilization of the resources for task D?
   c. One of your friends says that we can increase the capacity of this process by 50% if we cut the unit load of task C by half. Do you agree? Why?

5. UBC Pokémon club is providing students with Pokémon training services. Suppose the club opens at 10:00 and a total of 1500 students need to be registered before 3pm. Some students who dream to become Pokémon master arrive early at 7:00 and wait in a queue for registration. Because of the capacity of indoor room, a maximum of 300 students can be registered each hour after 10:00.
   a. What's the flow unit?
   b. Please complete the unfilled cells in the following tabular and then plot the inventory diagram.

Time Period	Input	Capacity	Output	Inventory at the end of each period
7am-8am	100	0	0	100
8am-9am	200	0	0	300
9am-10am	400	0		
10am-11am	400	300		
11am-12am	200	300		
12am-13pm	100	300		
13pm-14pm	50	300		
14pm-15pm	50	300		
Average				



c. Assume that students are served at a first-come-first-serve base, at which time spot will you choose to arrive in order to minimize your waiting time? Suppose you must arrive before 12:00.

(A) 8am; (B) 9am; (C) 10am; (D) 11am; (E) 12 pm

d. Is it possible for all 1500 students to be served before 3pm?

III. (Multiple Types and the Product Process Matrix)

6. Fill in the blank (Job shop vs. Flow shop)

Aspects	Job shop	Flow shop
Level of automation		
Facility scale		
Equipment specialization		
WIP inventory level		
Primary competitive advantage		

IV. (Variability in Processes)

7. Charlotte, an investment company, is trying to address growing customer complaints about service because of the long waiting times. You are asked to study the company's process and suggest improvements. Suppose that the average service time is 6 minutes per customer, and that 9.9 customers arrive every hour, on average. There is variability in both the arrival rate and in the service rate, and, assume that both of them have Poisson distribution. Based on the above information, do you think the queue is likely to be very long or relatively short? Give justifications.

8. UBC Okanagan has a small student-advising center with only one available advisor (don't take it seriously >_<) The advisor was told that students who need advices on their career paths will arrive in a Poisson distribution, and that the advisor will provide an exponential service distribution. Students usually come at a rate of 5 per hour. It will take the advisor an average of 10 minutes to serve one student. Based on the above information, find the following:

(a). The average length of queue for students waiting to be served.

(b). The average time a student waits.

(c). The total average time a student is in the advising center.

(d). The average utilization of the advisor's time.

9. Terminators are produced by one of the three identical machines. Each machine takes an average of 0.5 day to create a terminator, and this time period is exponentially distributed. The metals are brought to the machines at the rate of 150 tons per month (assume that a month has 30 days), Poisson distributed. (Each terminator requires 1 ton of metal).

(a). What is the utilization level of machines in this production process?

(b). The quality standard for these machines is that the waiting time of metal (the time period between a metal being put into the machine and starting being transformed into terminator) is no more than 1 days. What is the average waiting time in the current practice? Is it necessary to build another machine to meet the quality control standard?

V. (Project Management)

10. A plant startup is based on the following project management network:

Activity	Immediate Predecessor	Immediate Successor	Normal Time	Normal Cost	Crash Time	Crash Cost
A	-	D,E	4	100	2	150
B	-	G	6	80	2	140
C	-	F	2	40	1	60
D	A	G	3	80	2	120
E	A	-	5	80	3	140
F	C	-	4	60	1	100
G	B	-	6	120	2	160

a). Draw the network for this project and label the events

b). What is the normal project completion time and normal cost?

c). Identify the critical path.

d). How much will it cost to crash the project completion by 1 day? By 2 days?

e). What is the minimum time for project completion?

VI. (Cases and Readings)

1). Benihana

2). Kristen's Cookie

3). Shouldice Hospital

4). Deep Change Articles

5). A Taxonomy of Process Notes

6). Variability, Buffers and Inventory Note