

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

Section: \_\_\_\_\_

THE UNIVERSITY OF BRITISH COLUMBIA  
SAUDER SCHOOL OF BUSINESS

**COMM 204 PRACTICE QUIZ 1**

**Total Time: 40 minutes**

**Total Points: 40 points**

Professor: Michael Jong Kim

This quiz has 8 questions (5 True/False, 3 Short Answer) on pages 2 to 6. The last two (blank) pages can be used as scratch paper; do not write answers on these blank pages as they will not be marked. Make sure that you have all the pages.

For the *Short Answer* questions, you must show enough work for it to be reasonably clear how you arrived at your answer. If you write the correct answer but it is not clear how it was derived, you are not entitled to any marks. Explanations are **not** required for *True/False* questions.

Answers to all questions must be written in the spaces provided below each question.

Good luck!

For Instructor Use:

1-5. \_\_\_\_\_ (10 points)

6. \_\_\_\_\_ (15 points)

7. \_\_\_\_\_ (10 points)

8. \_\_\_\_\_ (5 points)

### Part I: True/False Answer Questions

(Write “True” or “False” below each question; 2 points each; 10 points total)

1. Given an inventory build-up diagram, under the “continuous” input/output rate assumption, the "area under the curve" equals the total inventory in the process over the time interval of interest.
2. Increasing the capacity rate of a non-bottle neck activity may in *some* cases increase the capacity rate of the process.
3. The utilization of the *bottleneck* resource is always 100%.
4. The throughput rate of a process is always less than the capacity rate.
5. Changing the average inventory of a process will always lead to a change in the average flow time.

## Part II: Short Answer Problems

### **Problem 1 (15 points)**

The year is 2045 (yes, the singularity is here) and interplanetary spaceflight (travel) is now possible. Humans have been settling on Mars for a while now, and in a typical year, the arrival rates of people to Mars for the first five months is given below:

Month of the Year	Arrival rate to Mars
January	100 (people/month)
February	200 (people/month)
March	100 (people/month)
April	50 (people/month)
May	0 (people/month)

Suppose Elon Musk, the newly elected president of the solar system, can personally welcome and process new inhabitants of Mars (Martians!) at a rate of 150 people per month, and moreover suppose there is a backlog of 300 people still waiting to be processed from the end of the previous year (2044).

- (a) Assume “continuous” inflow and outflow of people. Draw an inventory build-up diagram until the system empties. (10 points)

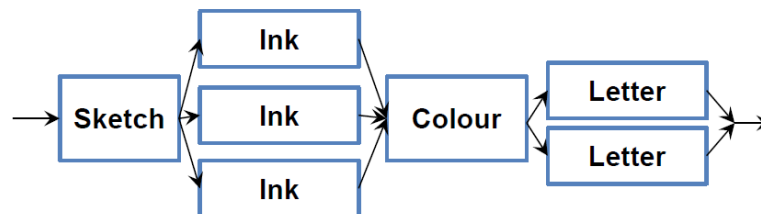
(b) How many people are waiting to be processed on average from January until the system is emptied? (5 points)

**Problem 2 (10 points)**

Consider the process of creating one page (flow unit) of a Wolverine comic book (see illustration below, if you don't read comic books):



There are four basic activities: sketching the page by pencil, inking the page (using blank ink only), colouring the page and lettering the page (adding words/dialogue). The flow chart below shows the sequence of activities, where the number of boxes indicates the number of staff artists available to perform that task. For example, for the inking activity, there are three artists available to do this activity in parallel. The table under the flow chart shows the unit load for a *single* artist to perform the corresponding activity.



Sketcher	Inker	Colourer	Letterer
2 hours	9 hours	4 hours	9 hours

(a) What is the flowtime, bottleneck and capacity rate of the process? (5 points)

(b) Suppose you hire an additional artist that can help with the bottleneck activity. What now is the flowtime, bottleneck and capacity rate of the process? (5 points)

**Problem 3 (5 points)**

A typical UBC student takes 0.5 weeks (on average) to complete an assignment. On average, there are 3 assignments due per week. How many assignment is the poor student working on at any given time (on average)?

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