**PGDM/PGDM-IB, 2015-17**

**ADVANCED OPERATIONS MANAGEMENT (DM- 541/IB-513)**

Trimester-V, End-Term Examination: December 2016

Time Allowed: 2 ½ hours

Max Marks: 50

Roll No:

Instruction: Students are required to write Roll No on every page of the question paper. Writing anything except the Roll No will be treated as Unfair Means. In case of rough work please use the answer sheet.

**Section A**

Please attempt any THREE questions. Each question carries 5 marks. **Please be brief.**

A1. A hungry customer is about to enter a restaurant. What would be the parameters on which she would evaluate the services? Name one operations related measure she could use for each parameter.

A2. The cumulative number of customers arriving at a Bank branch is recorded as a function of time, and the cumulative number of customers leaving the ATM is also counted as a function of time. What would be the plot of these numbers versus time look like (please draw). If you consider that the Bank 'processes' each customer, what parameters of the process can you measure using your plot? Please show these on the plot.

A3. What does the word aggregate connote in 'aggregate planning'? At what point in time does 'aggregate' become 'disaggregated'? Please explain.

A4. When you perform quartile analysis on employees of a service firm you find significant differences between the performance of the top and bottom quartiles, especially in knowledge intensive work. This difference may adversely impact the firm's productivity. How will you know (quantify) how much improvement you can achieve in the bottomline by raising the performance of the bottom quartile?

A5. Under what condition will the EOQ method of lot sizing give the same result as the POQ (period order quantity) method? Explain.

**Section B**

Please attempt any TWO questions. Each question carries 10 marks.

B1. An MRP schedule for an item is given below – for brevity it mentions only the period-wise net requirements. If the ordering cost is Rs.150 and the unit holding cost is Rs.2 a week, find the costs of the following lot sizing policies over the 10 weeks.

i. Fixed order quantity (EOQ) (5 marks)

ii. Fixed period (periodic order) (5 marks)

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Net Requirement | 20 | 10 | 20 | 25 | 0 | 15 | 10 | 20 | 0 | 30 |

B2. Consider a process consisting of five resources that are operated eight hours per day. The process works on three different products, A, B, and C:

| Resource | Number of Workers | Processing time for A (min) | Processing time for B (min) | Processing time for C (min) |
|---|---|---|---|---|
| 1 | 2 | 5 | 5 | 5 |
| 2 | 2 | 4 | 4 | 5 |
| 3 | 1 | 12 | 0 | 0 |
| 4 | 1 | 0 | 3 | 3 |
| 5 | 2 | 6 | 6 | 4 |

Demand for the three different products is as follows: product A, 40 units per day; product B, 50 units per day; and product C, 60 units per day.

a. What is the total time available at each resource in a day (in *worker-minutes*)? (3 marks)
b. Considering the demand for products A, B and C, what is the total time required at each resource in a day? (4 marks)
c. Which resource is the bottleneck? (3 marks)

B3. Prepare a master schedule, given that the forecast for each week for an eight week period is 50 units. Confirmed customer orders are given in the table below. The MPS rule is to schedule production if the projected on-hand inventory became negative. Also, determine the available-to-promise (ATP) quantities for each period. Use a production lot size of 75 units and no beginning inventory.

| WEEK | CUSTOMER ORDERS |
|---|---|
| 1 | 52 |
| 2 | 35 |
| 3 | 20 |
| 4 | 12 |

## Section C

The following jobs are waiting to be processed at a machine centre:

| JOB | DUE DATE | DURATION (days) |
|---|---|---|
| A | 260 | 30 |
| B | 258 | 16 |
| C | 260 | 8 |
| D | 270 | 20 |
| E | 275 | 10 |

In what sequence would the jobs be ranked according to the following decision rules: (a) FCFS, (b) EDD, (c) SPT? All dates are specified as calendar days. Assume that all jobs arrive on day 210 in the order A, B, C, D and E. Which do you surmise is the best decision rule? Show your working.