

JK Lakshmipat University Jaipur
INSTITUTE OF MANAGEMENT

End Term Examination, December 2024
BBA, Semester III, 2024-25

Roll No.....

OP1101: OPERATIONS MANAGEMENT

Time: 2.5 hours

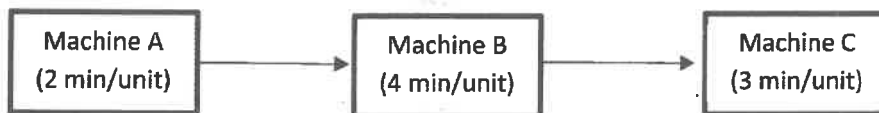
Max. Marks: 50

Instructions to students:

1. Do not write anything other than your roll number on the question paper.
2. This is an open book and open notes exam. However, the use of digital sources such as cell phones and laptops are not allowed.
3. Use of calculators is permitted.

Q. 1.1 Discuss the differences between bottleneck and constraint. Support your answers with the help of examples. 3.0
(LO1, 3)

Q. 1.2 Identify the number of units required for each of the Machine A, Machine B and Machine C, so that the system can be freed of bottlenecks. 4.0
(LO2)



Q. 1.3 Discuss various type of constraints. Support your answers with the help of examples. 3.0
(LO3)

Q. 2.1 A quality analyst wants to construct a sample mean chart for controlling a packaging process. He knows from experience that the process standard deviation is two ounces. Each day last week, he randomly selected four packages and weighed each. The data from that activity appears below. 6.0
(LO2)

Day	Weight			
	Package 1	Package 2	Package 3	Package 4
Monday	23	22	23	24
Tuesday	23	21	19	21
Wednesday	20	19	20	21
Thursday	18	19	20	19
Friday	18	20	22	20

- (a) Calculate all sample means and the mean of all sample means.
- (b) Calculate upper and lower 2-sigma x-bar chart control limits that allow for natural variations.
- (c) Based on the limits, is this process in control?

- Q. 2.2 An operator trainee is attempting to monitor a filling process that has an overall average of 705 cc. The average range is 17 cc. If you use a sample size of 6, what are the upper and lower control limits for the x-bar chart and R-chart? 4.0 (LO2)
- Q. 2.3 A hospital-billing auditor has been inspecting patient bills. While almost all bills contain some errors, the auditor is looking now for large errors (errors more than \$250). Each day last week, the auditor examined 100 bills and found an average defect rate of 16%. Calculate the upper and lower limits for the billing process for 99.73% confidence. 4.0 (LO2)
- Q. 2.4 A city police chief decides to do an annual review of the police department by checking the number of monthly complaints. If the total number of complaints in each of the 12 months were 15, 18, 13, 12, 16, 20, 5, 10, 9, 11, 8, and 3 and the police chief wants a 90% confidence level, are the complaints in control? 4.0 (LO2)

- Q. 3.1 An insurance claims processing center has six work centers, any of which can be placed into any of six physical departmental locations. Call the centers 1, 2, 3, 4, 5, and 6, and the departments A, B, C, D, E, and F. The current set of assignments is A-3, B-1, C-6, D-2, E-4, and F-5. 4.0 (LO1,2)

The (symmetric) matrix of departmental distances, in meters, is shown below.

	1	2	3	4	5	6
1	--	5	30	20	15	20
2		--	40	15	10	10
3			--	50	20	5
4				--	10	35
5					--	5
6						--

The matrix of work flow (estimated trips per day) among centers is shown below.

	A	B	C	D	E	F
A	--	15	20	0	30	0
B	20	--	50	0	160	10
C	0	50	--	30	0	30
D	30	60	20	--	70	0
E	40	0	0	10	--	60
F	0	0	30	20	50	--

The firm estimates that each trip costs approximately \$4. What is the cost of the current assignment?

- Q. 3.2 A work cell is required to make 80 computerized diagnostic assemblies (for installation into hybrid automobiles) each day. The cell currently works an eight hour shift, of which seven hours are available for productive work. These assemblies require five operations, with times of 1.0, 1.8, 2.4, 2.5, and 1.4 4.0 (LO1,2)

minutes each.

(a) What is takt time for this cell?

(b) How many workers will be needed?

- Q. 3.3 Cyclone Appliances has developed a new European-style convection oven that will be made on an assembly line. The schedule requires 80 ovens in an 8-hour day. The assembly includes seven tasks. The table below indicates the performance time and the sequence requirements for each task. 5.0
(LO1,2)

Task	Performance Time (minutes)	Task must follow Task listed below
A	1	
B	2	A
C	3	B
D	2	B
E	4	C, D
F	1	E
G	2	F

(a) What is the cycle time for this assembly operation?

(b) What is the theoretical minimum number of workstations?

(c) Draw the precedence diagram.

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- Q. 4.1 Discuss various costs related to quality and discuss which quality cost is most difficult to quantify. Support your answer with the help of examples. 3.0
(LO1, 3)
- Q. 4.2 Construct a cause-and-effect diagram showing why a student might be dissatisfied with the cafeteria. Mention at least 4 broad categories of causes, and at least 2 sub-causes under each category. 3.0
(LO1.2)
- Q. 4.3 An automobile manufacturing company plans to launch a new car in the economic segment for the Indian consumers. If you are the manager of this project, discuss six quality characteristics that you would like to focus. 3.0
(LO3)

all the best!

