

INDIAN INSTITUTE OF MANAGEMENT SIRMAUR

Mid Term Examination

Exam Duration: 120 min

Total Marks: 25

Programme & Batch	:	MBA & MBATM & MBATHM & PHD
Name of the Course	:	Operations Management
Term	:	II
Name of the Course Faculty	:	Prof. M. Pachayappan
Open/Closed Book & Notes	:	Closed

Instructions:

Some questions have a note – Follow the Note to represent your answers

The total number of questions is five

Only calculator is allowed and other electronic devices including smart watch is not allowed

Write all answers in the answer sheet and not in the question paper.

A small manufacturing workshop is planning to process five jobs (J1, J2, J3, J4, and J5) using two machines, Machine 1 and Machine 2, in a flow shop scheduling setup. Each job must first be processed on Machine 1, then on Machine 2. The goal is to determine a job sequence that minimizes the overall completion time for all jobs using Johnson's algorithm.

Job No	Processing Time in min	
	Machine 1	Machine 2
J1	414	770
J2	646	303
J3	522	433
J4	877	677
J5	188	166

Note:
Use the same table format to represent the calculation in the answer sheet

Template Table	Processing Time					Idle Time of Machine 2	Ready Time
	Machine 1		Machine 2				
Job Sequence	Time-In	Time-Out	Time-In	Time-Out			
1							
4							
3							
2							
5							

1. Determine the Johnson's sequence for the given jobs. Calculate the makespan for the sequence. Compute the idle time for machine 2 and ready time for jobs based on this sequence. (5 Marks)

2. For each of the following situations, identify the type of inventory policy you would use and brief it. (5 Marks)
 - a) Stocking fresh food in your kitchen.
 - b) Getting a daily newspaper.
 - c) Restocking raw materials, like steel, for an automobile manufacturing plant.

Taco Bell's Menu Expansion

Like most restaurants, Taco Bell trimmed its menu during the pandemic, hindered by labor shortages and added channels that pressured operations during an extremely uncertain time. But those challenges are in the rear-view mirror and now the company is ready to push hard on the gas, doubling its launches of menu this year versus 2024.



Those launches include an entirely new menu – Cantina Chicken, which brings products like oven-roasted, shredded chicken, purple cabbage, pico de gallo, and white corn taco shells to the more than 7,000 U.S. Taco Bell restaurants across the country (USA).

Such added menu complexity comes with significant risks. It can slow down service, impact accuracy, fluster team members, turn off customers, and even anger franchisees. Chief Food Innovation Officer *Liz Matthews* said the company's robust pipeline, however, has energized both franchisees and team members.

She said “Yes, there is complexity around it, but there is so, so much excitement.”. “For us, the idea has to be worth it. We can’t swing at every idea. We’ve got to swing only at the big ideas and make sure we are supporting our team members and making sure their life in the restaurants is as easy as possible.

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Taco Bell's new menu news go far deeper than just the Cantina launch, spanning everything from Cheesy Chicken Crispanadas to Cheez-It Crunchwraps to Churro Chillers shakes. The shakes went into test in December and required the addition of a blender in the two participating restaurants, for instance. They will go into a bigger test this year and could require all restaurants to add that new piece of equipment, or even a different piece of equipment.

"Blenders were used in test. Could it be something else as we launch nationally? Maybe. There's work to be done," Matthews said. "But while we sort these things out, the idea has our franchisees really excited. (Shakes) are a ticket add-on, a special trip intent, an afternoon trip, a late-night trip. This is a big idea, and the fans are asking for it and our franchisees are excited about it."

The company recently shared that it is on track to operate 10,000 U.S.-based restaurants "in the coming years," and exited 2023 with record site registrations for new units. This bullish growth comes as Taco Bell delivers "industry-leading" margins of 24% and average unit volumes of about \$1.95 million, according to US market data. And, complexity aside, executives are confident these new menu items will continue to provide a strong tailwind for the brand.

3. With the introduction of new items requiring specialized training, like Churro Chillers shakes and Cantina Chicken, how should Taco Bell adjust its scheduling and staffing to ensure team members are well-prepared without compromising day-to-day operations? What scheduling approach could best support these training needs. Brief it? **(5 Marks)**

 4. As Taco Bell prepares to roll out the Cheesy Chicken Crispanadas and other new items nationwide, what forecasting methods could help anticipate demand accurately? How might this forecasting impact the process and equipment needs, such as deciding whether to use blenders or alternative equipment for shakes in all restaurants? **(5 Marks)**
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5. Using the LL Bean Forecasting Method, analyze the table below. The product listed is classified as a never-out item, and the expert recommendation is to maintain a minimum inventory level of 80% for the upcoming season, while the revenue decision suggests keeping at least 60%. The frozen demand is 2000 units. Calculate the a/f ratio, rank, and frequency distribution based on the provided actual and demand data in the table below. (5 Marks)

Years	Actual	Forecasted	A/F	Rank	Frequency Distribution
2012	6	4			
2013	70	71			
2014	55	54			
2015	589	688			
2016	589	985			
2017	48	42			
2018	136	120			
2019	150	120			
2020	33	48			
2021	1377	1458			

Note:
Use both table format to represent the calculation in the answer sheet

		Minimum Quantity	Maximum Quantity
1	Expert Opinion		
2	Revenue Strategy		