Enrolment No. _____

AHMEDABAD UNIVERSITY

AMRUT MODY SCHOOL OF MANAGEMENT

UNDERGRADUATE / GRADUATE PROGRAMMES

2024 WINTER SEMESTER

FINAL EXAMINATION

TOD333 LOGISTICS AND TRANSPORT MANAGEMENT

Date: **22-04-2024** Total Marks: **100**

Time: **11:00 am – 1:30 pm** No. of printed pages: **04**

Instructions

1. *All questions are compulsory.*
2. *Answer the two parts in separate answer books.*
3. *The values in square parentheses are marks, with marks of sub-questions (if any) mentioned in the question.*
4. *This is NOT an open-book exam, so carrying any reference material (including digital notes) will disqualify you from the exam.*
5. *You should use only physical calculators (scientific ones are allowed), but you cannot use calculators on a mobile phone.*
6. *Show all the steps of the calculations.*

PART-1

Question 1: Answer any THREE [15] (based on the cases discussed in the class)

A. Compare the operations of Mumbai Dabbawala and Uber Express POOL, highlighting the similarities and dissimilarities. What are the key learnings and possible enhancements to their business models?

B. Summarise Brarsil's transport and logistics sector and how did *Hidrovias do Brasil* fit in?

C. In the "JSW Steel: A logistic dilemma" case, what was Arun Kumar's dilemma, and what were the associated challenges? What factors need to be considered in addressing these challenges?

D. Elaborate on Uber's disruptive power and explain what prominent behavioural trends (both rider and driver) that Uber takes advantage of.

E. What were the issues faced by KM Trans Logistics at the workshop, and what remedial measures you suggest?

NOTE:- Please Refer Harvard Article:- How Global companies use AI to Prevent Supply Chain Disruptions by Remko van Hoek and Mary Lacity. ✓ 1

Question 2: Answer any FIVE [15]
(Note: the selected questions must NOT be from your own assignment group topic)

A. Explain AMUL's supply chain from the dairy farmer to the consumer. What was the impact of COVID-19 on AMUL's business, and how did they deal with it?

B. Explain the key challenges to Zomato Intercity Legends and discuss potential solutions. How would you address its carbon footprint issue?

C. Explain the problems at Finolex Cables before implementing an important technological innovation. What were the specific impacts of these changes?

D. Explain the problems at Fitwell Pharma before implementing an important technological innovation. What were the specific impacts of these changes?

E. Explain the problems at Shree Shyam Dhani Granites and discuss potential solutions. What was the impact of COVID-19 on Shree Shyam Dhani Granites?

F. Explain the problems at the Indian Post and discuss potential solutions. What was the impact of COVID-19 on India Post services?

G. Explain the problems faced by the company and its customers with IOCL (LPG gas cylinder division). What would you recommend to address these problems?

H. Explain the specific problems at Decathlon before implementing an important technological innovation. What were the specific impacts of these changes?

I. Explain Walmart's key transport and logistics challenges and discuss potential solutions.

J. Explain the technological innovaitons by Bluedrat. What were the two problems discussed in the presentation, and what was Bluedarft's solution? List and briefly explain Bluedart's green initiatives.

K. What was lacking in the Aditya Birla group's epoxy resin business, and how could it be improved?

Question 3: Read the article "How global companies use AI to prevent supply chain disruptions" (attahed with this paper, seven numberd pages), and based on this article, answer the following questions. [30]

A. Why are global companies turning toward AI for supply chain management? What advantages do AI tools offer? [5]

B. How does AI find alternative suppliers? Are there any manual steps involved? Discuss giving examples. [10]

C. What are the advantages of AI in supply chain management? Cite examples from the article. [10]

D. What are the key considerations for firms looking to adopt AI in managing their supply chains? [5]

PART-2

Question 4 [30]

Gold City is divided into three zones for a transport study. A recent survey revealed the work-trip distribution by personal automobiles as follows (in thousands):

Base year	*Zone*		
Zone	*1*	*2*	*3*
1	05	07	08
2	12	09	10
3	13	11	15

Based on a trip generation model, the city's transport managers estimate that five years from now, the number of origins and destinations (in thousands) will be as follows:

Future year	*Zone*		
	1	*2*	*3*
№ of origins (productions)	48	54	66
№ of destinations (attractions)	66	48	54

The average estimated travel cost matrix (which includes the value of time and fuel expenses) is as follows:

Costs (Rs./trip × 100)	*Zone*		
Zone	*1*	*2*	*3*
1	1	2	3
2	2	1	3
3	2	3	1

Estimate the future trip distribution matrix using an **origin-constrained** or a **destination-constrained** gravity model. The cost function is a power function with a parameter value of one.

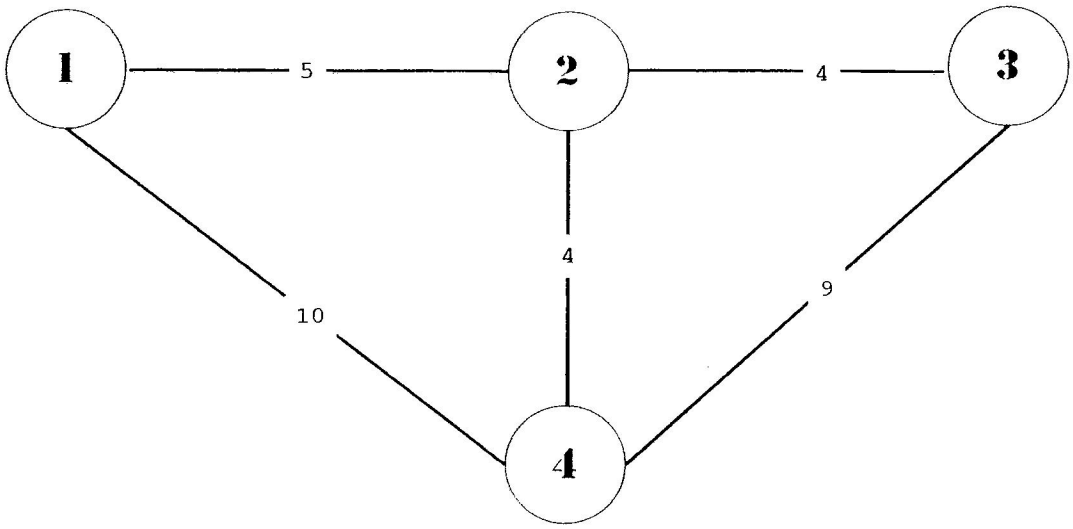
Question 5 [10]

Using the data in Question 4, estimate the future trip distribution matrix using an **unconstrained gravity model**. The measure of attractiveness for origins and destinations should be taken as the number of future origins and destinations. The cost function is a power function with a parameter value of one.

OR

The table below shows the trip distribution matrix of four zones. Using the **all-or-nothing** trip assignment method, calculate the traffic volume on all links using the network diagram below.

Zone (FROM)	*Zone (TO)*			
	1	*2*	*3*	*4*
1	-	150	100	200
2	300	-	250	100
3	250	100	-	100
4	250	150	300	-



Note: All link distances are in km. The diagram is not to scale.

End of the question paper

Some useful formulas

$$T_{ij}^{(1)} = t_{ij}\frac{(\gamma_i^O + \gamma_j^D)}{2};\ \gamma_i^O = \frac{O_i}{\sum_j t_{ij}};\ \gamma_j^D = \frac{D_j}{\sum_i t_{ij}};$$

$$T_{ij}^{(2)} = T_{ij}^{(1)}\frac{(\gamma_i^{O(1)} + \gamma_j^{D(1)})}{2};\ \gamma_i^{O(1)} = \frac{O_i}{\sum_j T_{ij}^{(1)}};\ \gamma_j^{D(1)} = \frac{D_j}{\sum_i T_{ij}^{(1)}};\ \text{and so on ...}$$

$$T_{ij}^{(1)} = t_{ij}\frac{O_i}{\sum_j t_{ij}};\ T_{ij}^{(2)} = T_{ij}^{(1)}\frac{D_j}{\sum_i T_{ij}^{(1)}};\ T_{ij}^{(3)} = T_{ij}^{(2)}\frac{O_i}{\sum_j T_{ij}^{(2)}};\ \text{and so on ...}$$

$$T_{ij} = A_i O_i D_j f(c_{ij});\ T_{ij} = \propto W_i W_j f(c_{ij});\ T_{ij} = B_j O_i D_j f(c_{ij});$$

$$A_i = \left[\sum_j D_j f(c_{ij})\right]^{-1};\ B_j = \left[\sum_i O_i f(c_{ij})\right]^{-1}$$