

**UNIVERSITY OF PETROLEUM
AND ENERGY STUDIES**



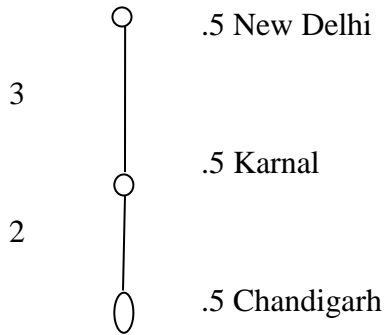
End Semester Examination – May, 2017

Program/course: MBA UID	Semester – II	
Subject: Urban Transport Economics Planning & Management	Max. Marks	: 100
Code : MDSI 817	Duration	: 3 Hrs
No. of page/s: 4		

Section- A

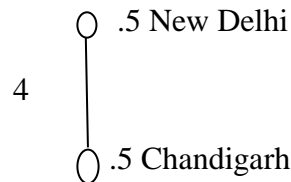
This question deals with a simplified high-speed intercity rail service in the Northern Railway. In Option A, the service has three stops, in New Delhi, Karnal and Chandigarh.

OPTION A



The link travel times are 3 hours & 2 hours respectively between each pair of cities in both directions. The time it takes to service the train at each node is 0.5 hours. People in New Delhi and Chandigarh are interested in better service between these two major cities and suggest not stopping in Karnal. This is Option B.

OPTION B



The travel time between New Delhi and Chandigarh in both directions is now 4 hours. The time it takes to service the train in New Delhi and Chandigarh is still 0.5 hours.

1. With that number of trains, what frequency can you provide for Option A, with the trains uniformly distributed through the day? (2)

If the numbers come out non-integer, go back and check your work!

Here is some additional information.

The following is a matrix of coefficients used for estimating demand between each pair of cities.

K MATRIX

	New Delhi	Karnal	Chandigarh
New Delhi	X	150	300
Karnal	150	X	100
Chandigarh	300	100	X

Here is the FARE Matrix -- FARES IN Rs.

FARE MATRIX

	New Delhi	Karnal	Chandigarh
New Delhi	X	300	500
Karnal	300	X	100
Chandigarh	500	100	X

The demand between any pair of cities is

D is Demand

FREQ in trains/day

$$D = \frac{K * FREQ * 1000}{T * FARE}$$

T in hours

FARE in \$

Where

T is the travel time between those cities;

K is taken from the K Matrix for that city pair;

FARE is taken from the FARE Matrix for those two cities.

To make the calculations simpler, the system is perfectly symmetrical with respect to direction of travel.

2. Calculate the demand between all pairs of cities for both Options A and B. (2)

NOW, you are ready to answer the real question!

4. YOU ARE THE TRAIN COMPANY. SHOULD YOU STOP AT KARNAL? (2)

Do whatever further calculations you need to and indicate whether or not you would stop at Karnal and explain why. (8)

5. NOW, considering only Option B, and considering the travel time and train service times and the K matrix as fixed, explore some changes to this service and suggest which changes (5)

Section- B

4x5=20

1. Write a Short note on 3 types of Interrelationship of TSA
2. What are the social costs that we take into account for calculating Cost Benefit Analysis?
3. Explain Gross Contract for urban bus system.
4. What are the major strategic elements while planning for Non-Motorized transport?
5. Discuss the critical questions that must be addressed in designing MRT strategy.

Section-C

2x15=30

Answer any 2 questions

1. Formulate the OD matrix from the following PA matrix data. Take Lamda value as .4.

	Zone 1	Zone 2	Zone 3
Zone 1	30	40	30
Zone 2	60	20	20
Zone 3	40	30	30

2. Write down the guidelines for planning a Bus Rapid Transit.
3. Draw a flowchart for transport planning process and explain trip generation and Modal split.

Section D

30

The Mayor of New York City wants to replace the elevated Gowanus Expressway in Brooklyn with a tunnel so as to enable the development of prime Brooklyn waterfront property. He is interested in using the private sector to finance, construct, and operate this project, which will require tolling of the new facility. For the sake of this problem, let us assume:

- The average toll will be \$4.50, and does not increase over time
- There is no inflation

- All parties use a discount rate of 10%
- Traffic on the Expressway is the same for every day of the year
- All years have 365 days
- The annual traffic on the first year of operation of the new facility is uncertain, but every year thereafter will be the same as the first

Let us also assume that there are two bidders for this project who have, through their own analysis, worked out the following financial packages:

	Cost to Build (Present Value)	Operation and Maintenance Costs + Expected Profits (Present Value)
Firm A	\$650 Million	\$160 Million
Firm B	\$700 Million	\$70 Million

You are advising the mayor on this project, and have commissioned a traffic forecast for use by the various private players, which has the following results:

Scenario	Daily Traffic
Worst Case	43,000 vehicles/day
Expected	47,000 vehicles/day
Best Case	51,000 vehicles/day

Under the traditional contract structure, the winning bidder would build the new facility and then maintain and operate it while collecting all toll revenues for 99 years. At the end of 99 years of operations, ownership transfers over to the City. For this kind of contract, the bidders only reveal to the City their Cost to Build the facility.

Please answer the following questions:

a) For **both firms**, calculate the **minimum daily volume of traffic** required to meet their financial goals for the project. **(12)**

b) As part of the bidding process, all bidders had to define the bonds they would sell to finance the construction of the facility. Given the forecasts that were published, if you were a banker on this deal, **which bidder's bonds** would you insist **have a higher interest rate**? Why? **(10)**

c) Is this type of arrangement better characterized as *privatization* or *PPP*? Why? **(8)**