Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M. Tech. Winter 2017 - 18 Examination

Semester: 2 **Date: 10/01/2018**
Subject Code: 03211153 **Time: 2:00pm to 4:30 pm**
Subject Name: Economic Evaluation of Highway Projects **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) What are the broad objectives of economic evaluation of proposed transportation plan? What are the different methods of economic evaluation? **(05)**

B) What are the components of capital cost and benefits of a new transport facility? **(05)**

C) It is proposed to float a loan of Rs 9×10^7 at 6% simple interest for the cost of bridge. The maintenance charges including the cost of administration of toll is Rs. 60,000 per year. The capital cost is to be recovered in a period of 20 years. What rate of toll per tonne of traffic should be levied if traffic is 3000 tonne per day for 365 days during the year? **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**

A) What are tangible and intangible benefits of highway project?

B) What are various methods which are commonly used for economic studies? Explain annual cost method.

C) Explain briefly the value of travel-time study.

D) Determine the rate of return method of economic analysis using the following data:

Sr. No.	Item	New Road	Existing Road
1.	Annual vehicle – km	8,25,000	9,60,000
2.	Ave. cost per vehicle –km	Rs. 6.50	Rs.9.00
3.	Number of accidents per thousand kms.	2.8	5.3
4.	Cost per accident	Rs. 10,000	Rs. 10,000

Assume the cost of proposed new road as Rs. 9,90,650 and maintenance cost to be expected to be about Rs. 25,000.

Q.3 A) How project planner can estimate total cost of accidents? What are alternative methodologies of accident costing? **(07)**

B) What are the points to be considered to arrive at the annual road user cost and annual highway cost? **(08)**

OR

B) A single lane road 50 km long is to be widened to two lane road at a cost of Rs. 60 lacs per km including all improvements. The cost of operation of vehicles on a single-lane road is Rs. 6 per vehicle-km, whereas it is Rs. 5 per vehicle-km on the improved facility. The average traffic may be assumed 2400 vehicle per day over a design period of 15 years. The interest rate is 8% per annum. The cost of maintenance is Rs. 1,50,000 per km on existing road and Rs. 90,000 per km on the improved road. **(08)**

Is the investment in the improvement scheme worthwhile?
Take the value of CRF = 0.11683.

Q.4 A) Calculate the annual cost of a stretch of road from following data: **(07)**

Item	Total cost in Lacs Rs.	Estimate life in years	Rate of interest in %	CRF
Land	120	100	6	0.06018
Earthwork	90	30	8	0.08883
Bridge & Culverts	100	60	8	0.08080
Pavement	160	15	10	0.13147

The average cost of maintenance is Rs 6 lacs per year.

OR

A) What are possible approaches for evaluation of passenger travel time? What are the alternatives involving for different performance approach? **(07)**

B) What are sources of revenue and taxes levied by central and state governments? **(08)**