

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Winter2018 Examination

Semester:1
Subject Code: 203211130
Subject Name: Geometric Design of Highway

Date: 12/12/2018
Time: 10:30 am to 1:00pm
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) Explain the following with IRC specification: **(05)**
 i) Ruling gradient
 ii) Superelevation
 B) Explain the different surveys carried out for selecting an alignment of highways. **(05)**
 C) Explain PIEV Theory. **(05)**
- Q.2 Answer the following questions.** (Attempt any three) (Each five mark) **(15)**
 A) What are the types of road patterns? Explain with neat sketch.
 B) Explain the difference between rotary and roundabout with neat sketch.
 C) Explain overtaking sight distance and overtaking sight zone with the help of neat sketch.
 D) Find the stopping sight distance for the descending gradient of 2% for a design speed of 80 kmph other data taken from IRS standard specification. Coefficient of friction is 0.35?
- Q.3** A) Enlist the cross sectional elements of highway and describe any two in details. Draw the sketch of sectional view of highway. **(07)**
 B) The width of approaches for a rotary intersection is 12 m. The entry and exit width at the rotary is 10 m. Table below gives the traffic from the four approaches, traversing the intersection. Find the capacity of the rotary. **(08)**

Approach	Turning		
	LEFT	STRAIGHT	RIGHT
N	400	700	300
S	350	370	420
E	200	450	550
W	350	500	520

OR

- B) While designing a highway in built up area it was necessary to provide horizontal curve of radius 325m. With Design Speed = 65kmph, Length of wheel base = 6.1m, Pavement Width = 10.5 m Design the following geometric features: **(08)**
 a) Super elevation b) Extra widening of pavement c) Length of transition curve.
- Q.4** A) Illustrate with a sketch angled on-street parking facility and derive the length required to park N number of vehicles with the help of neat diagrams. **(07)**
- OR**
- A) Enlist the different types of bicycle facilities that can be provided. **(07)**
 B) The speed of overtaking and overtaken vehicle are 70 kmph and 40kmph respectively, on two way traffic road .If the acceleration of overtaking vehicle is 0.95m/sec^2 **(08)**
 I) Calculate the safe overtaking sight distance
 II) Calculate minimum and desirable length of OSD
 Draw the neat sketch of overtaking zone and show the position of the sign post.