Roll No. .....

23280

M. Tech. 2nd Semester (Civil Engg.) (Transportation Engg.) (Elective-IV) Examination – June, 2023

GEOMETRIC DESIGN OF HIGHWAYS

Paper : CE-645

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions. All questions carry equal marks.

1. What are the factor controlling geometric design elements ? Explain in detail. 20

2. (a) Calculate the overtaking sight distance for a design speed of 96 kmph. Assume all suitable data. 10

(b) What are the factors on which superelevation depends ? Explain. 10

3. (a) Give a descriptive note on : 15

(i) Road Margins

(ii) Right of way

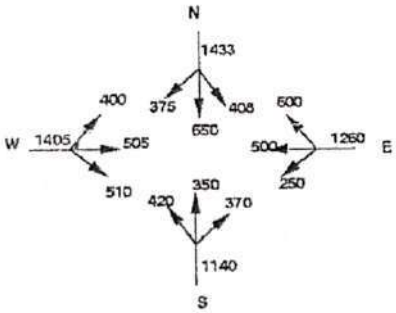
(iii) Traffic separators

(b) With the help of neat sketch explain typical cross sections of a typical urban arterial road. 5

4. (a) What are effects of design speed on horizontal alignment design ? What are the design speeds for different classes of roads specified by IRC ? 10

(b) Explain level of service concept while deciding the design capacity of a road. 10

5. The width of a carriage way approaching an intersection is given as 15 m. The entry and exit width at the rotary is 10 m. The traffic approaching the intersection from the four sides is shown in the figure below. Find the capacity of the rotary using the given data.



6. When traffic volume is very low construction of a rotary cannot be justified, Comment. Suggest the suitable road intersection type under such situation. 20

7. Find super elevation on a horizontal circular curve of 150 m radius for design speed of 65 Kmph with a coefficient of friction 0.15. 20

8. Calculate the length of the transition curve with the following data : Design speed = 70 kmph, Radius of circular curve = 250 m Allowable rate of introduction of super elevation = 1 in 150. Pavement width including extrawidth = 7.5 m. 20