

27/4/13



COLLEGE OF ENGINEERING, GUINDY  
B.E./B.Tech (Full Time) DEGREE EXAMINATION,  
CIVIL ENGINEERING BRANCH  
FIFTH SEMESTER (REGULATIONS 2008)  
EXAMINATION (April/May 2013)  
CE 9305 – HIGHWAY ENGINEERING

Time : 3 Hours

Max Marks : 100

**PART – A**

**(10 x 2 = 20 Marks)**

- 1) Enumerate any 2 Obligatory and non-Obligatory points in Road alignment?
- 2) What is a Cul-De Sac?
- 3) Draw a typical Cross section of a flexible pavement.
- 4) What are the different types of kerbs?
- 5) Define PIEV.
- 6) Why are transition curves provided in road sections?
- 7) Draw the load distribution curve of flexible and rigid Pavements.
- 8) Define axle load and its various types.
- 9) State the significance of subgrade.
- 10) What is Vehicle Damage Factor?

**PART – B**

**(5 x 16 = 80 Marks)**

- 11 a. What are the steps for "Engineering Surveys" for highway alignment and explain with neat sketches the objectives, the methods of carrying out the surveys, the instruments used, data collected and the end products of each one of the surveys. **(16)**
  - 12 a.i. Derive an expression for "overtaking sight distance" **(8)**
  - 12.a.ii The speeds of overtaking and overtaken vehicles are 50 and 40km/hr. respectively. If the acceleration of the overtaking vehicle is 2.5km/hr/sec. Design speed is 60km/hr. and the reaction time is 2 seconds. Calculate the safe overtaking sight distance for a two way traffic road. **(8)**
- (OR)
- 12 b. Design the Flexible Pavement for the construction of new highway with the following data:  
No of commercial vehicles as per last count = 4000 CV/day; Period of construction = 4 years;  
Design CBR of Subgrade soil = 10%; Category of road = NH, 4 lane single carriageway; Design life 15 years. Assume suitable data **(16)**
  - 13.a Discuss the geometric cross sectional elements of an Urban Road with a neat diagram. **(16)**
- (OR)
- 13 b. What is the relevance of widening of roads in curves and what are the types of widening provided to arrive at the width of the carriageway. **(16)**

14 a. State the difference between Flexible and rigid Pavements. Also discuss the material components of both. (16)

(OR)

14b. Discuss the any 2 properties of Aggregates and Bitumen and its laboratory investigations. (16)

15 a. Discuss any 3 failures, Repairs and Maintenance of flexible and rigid pavements. (16)

(OR)

15 b. Draw and explain the working of Benkelman Beam. (16)