
YEAR/SEM:II/II

UNIT-I

1. Briefly outline the highway development in India.
2. Explain the necessity and objectives of highway planning?
3. What are the factors affecting the highway alignment.
4. What are the different Road Development Plans in India? Discuss them in detail
5. Explain the engineering surveys needed for a highway project and data to be collected.
6. What is the importance of Nagpur road plan in highway planning of our country? Explain the plan formulae and the salient features of the plan
7. Explain obligatory points? What are the uses of map study in engineering surveys?
8. What are the different road network patterns? Explain them in detail with neat sketches.

UNIT – II

- 1.Explain the summit and valley curves and the various cases when these are formed while two different gradients meet.
- 2.Explain in detail about highway cross section elements?
- 3.Discuss about transition curves and extra widening?
- 4.Define can't?Design superelevation for flexible pavements?
- 5.The design speed of a highway is 90 Kmph. There is a horizontal curve of radius 190 m on a certain locality. Calculate the super-elevation needed to maintain this speed. If the maximum super-elevation of 0.07 is not to be exceeded, calculate the maximum allowable speed on this horizontal curve as it is not possible to increase the radius. Safe limit of transverse coefficient of friction is 0.15.
- 6.Explain the ruling, maximum and exceptional gradients.
- 7.The speed of overtaking and overtaken vehicles are 90 Kmph and 45 Kmph respectively on a two way traffic road. If the time taken by the overtaking vehicle is equal to 7.5 seconds and reaction time of the driver is equal to 2 seconds, calculate the safe overtaking sight distance.
- 8.What are the objects of highway geometric design? List the various geometric elements to be considered in highway design.
- 9.Derive an expression for finding the extra widening required on horizontal curve.
- 10.Discuss about vertical curves with neat sketches and formulaes?

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UNIT – III

1. What are the objectives and uses of volume study.
2. What are the various types of traffic accidents and explain the various measures to prevent accidents.
3. Explain briefly the various aspects investigated during parking studies. What are the uses of these studies?
4. What a detailed note on road accidents and its preventive measures
5. Write in details about the traffic counting.
6. Write the various IRC equivalent factors of vehicles for Rural roads.
7. What are the objectives and uses of volume study.
8. How are the traffic signal times decided based on Webster's Method.
9. Explain the design steps involved in Rotary intersection.
10. Explain at grade intersections, the advantages and limitations.
11. Write a short note on speed studies? And discuss about spot speed and speed & delay studies?

UNIT – IV

1. What are the tests for aggregate used in highway. Explain them in brief?
2. What are the various tests conducted on bitumen. Explain them in brief?
3. Explain the plate bearing test procedure and how corrections for 'K' value may be made for a different plate size and for accounting for worst moisture conditions
4. Discuss the desirable properties of the bitumen. Compare tar and bitumen.
5. The properties of a subgrade soil are given
below Liquid limit = 75 %
Plastic limit = 55 %
Passing No. 200 sieve = 70 %
(i) Determine the group index and classify the soil by HRB soil classification system.
(ii) Determine the suitability of the soil as a subgrade material.
6. What are the desirable properties of the bitumen mixes? What are the steps on

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bituminous mix design? Discuss briefly?

7. Explain the CBR and the test procedure for the laboratory and field tests. How are the results of the test obtained and interpreted?

UNIT – V

1. The CBR value of soil is 5 %. Calculate the total thickness of flexible pavement using design charts developed by IRC.
2. Estimate the thickness of concrete using the method suggested by Indian road congress.
Modulus of elasticity of concrete = 3.0×10^5 kg/cm²
Modulus of rupture of concrete = 40 kg/cm²
Poisson's ratio of concrete = 0.15
Modulus of subgrade reaction = 6 kg/cm²
Wheel load = 5100 kg
Radius of contact pressure = 15 cm
3. Explain the critical wheel load locations considered in Westergaard's theory? Write the significance of each location in the analysis of load stresses?
4. Explain in detail about the CBR and IRC methods for flexible pavements.
5. Explain and discuss about the various stresses in rigid pavements.
6. What are roller compacted roads? Explain about joints in rigid pavements
7. Write BURMISTER method for flexible pavements.

UNIT – VI

1. Compare the alternate bay and continuous bay methods construction of cement concrete roads
2. Discuss about maintenance for flexible and rigid pavements?
2. What are the advantages and drawbacks of flexible roads? Explain about the construction procedure?
4. List out the different methods of road construction. Discuss their advantages and limitations.
5. Specify the materials required for construction of WBM roads. What are the uses and limitations of this type of road?
6. Compare the following methods of bituminous road construction
 - (i) Central plant mix and road mix methods
 - (ii) Hot mix and cold mix.