

Time: Three Hours

Maximum Marks: 80

“Please check whether you have got the right question paper.”

i) Figure to right indicates full marks.

ii) Q. No. 1 and Q. No. 6 are compulsory & solve any two questions from remaining from each section.

## SECTION-A

- Q.1 A two lane road with design speed 80Kmph has horizontal curve of radius 480m. Design the rate of super elevation for mixed traffic. By how much should the outer edges of the pavement be raised with respect to the centre line, if the pavement is rotated with respect to the centre line and the width of the pavement at the horizontal curve is 7.5m? 10
- Q.2 a) Discuss the effects of shape of camber and the effects of providing steep cross fall. 07  
b) State and explain traffic separators. 08
- Q.3 The speed of overtaking and over taken vehicles are 70 and 40kmph, respectively on a two way traffic road. If the acceleration of overtaking vehicle is  $0.99\text{m/sec}^2$  15  
1) Calculate safe overtaking sight distance  
2) Minimum length of overtaking zone  
3) Show with neat sketch overtaking zone and sign post.
- Q.4 a) What is the importance of Nagpur road plan in highway planning of our country? Explain the plan formula and the salient features of the plan. 08  
b) Discuss the desirable properties of bitumen. compare tar and bitumen. 07
- Q.5 Explain CBR and test procedure for laboratory and field tests. How are the results of the test obtained and interpreted? 15
- SECTION-B
- Q.6 Calculate the equivalent radius of resisting section of 20cm slab, given that the radius of contact area wheel load is 15cm. 10
- Q.7 Write short notes on (any three) 15  
1) Skidding of pavement surfaces.  
2) Spacing of joints  
3) Reflection cracking  
4) Map cracking.
- Q.8 Discuss the object of the following types of joints (any three) draw neat sketches 15  
1) Expansion joint  
2) Contraction joint  
3) Warping joint  
4) Longitudinal joint
- Q.9 a) What are the various types failures in flexible pavement? Explain the causes? 08  
b) State the functional classes of traffic signs with example. 07
- Q.10 a) Discuss the uses and limitations of R.C.C and pre stressed concrete pavement for highways. 08  
b) Explain how the maintenance of the following pavement are carried out 07  
1) Bituminous surface. 2) Cement concrete pavement.