Registration No :

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B.Tech.
PCCI4302

5th Semester Back Examination 2019-20
TRANSPORTATION ENGINEERING - I
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 70
Q.CODE : HB451
Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions :**   **(2 x 10)**
   a) What is Macadam's method of road construction?
   b) What are the various factors which control the highway alignment?
   c) Describe with sketch how obligatory point controls the alignment.
   d) What is camber?
   e) The width of the state high way of bituminous concrete pavement is 7 m then what should be the height of the crown with respect to the edges.
   f) What are factors that govern the length of summit curve?
   g) What is traffic volume? What are the objects of carrying out traffic volume studies?
   h) Show the conflict points at the intersection of cross-roads and both two way.
   i) What is use of emulsion? How are they preparing?
   j) Differentiate between expansive and contraction joint.

Q2 **a)** Describe the different stages involved in the route survey of highway project.   **(5)**
    b) Compare the Nagpur road plan and second twenty year road plan.   **(5)**

Q3 **a)** Describe and explain the assumption made in the derivation of overtaking sight distance.   **(5)**
    b) Design the super elevation required at a horizontal curve of radius 300m for a speed of 60 kmph. Assume suitable data.   **(5)**

Q4 **a)** What are different causes of road accident and how can the road accidents be minimized?   **(5)**
    b) Name the various types of traffic signs. Classify them in proper group.   **(5)**

Q5 **a)** What are various tests carried out on bitumen? What are the desirable properties of bituminous mixes? What are the steps of bituminous mix design explain briefly?   **(5)**
    b) The average normal speed on cross road A and B during design period are 400 and 500 pcu per hours: the saturation flow values on these roads are estimate as 1250 and 100 cpu per hous respectively. The all red time required for pedestrian crossing is 12 secs. Design two phase traffic signal by Webster's method.   **(5)**

Q6 While aligning a highway in a built up area, it was necessary to provide a **(10)** horizontal circular curve of radius 324 mt having design speed 65 kmph, length of wheel base of largest truck is 6m and pavement width is 10.5 m. Design the following geometric features :
a) Superelevation
b) Extra widening of pavement
c) length of transition curve.

Q7 Explain how the dimensions and spacing of tie bars are design. **(10)**

Q8 **Write short Notes on any TWO :** **(5 x 2)**
a) Second twenty year road plan of 1961-81
b) PIEV theory
c) Westergaard's concept of temperature stress