Total No. of printed pages = 3

CT-505/TE/5th Sem/M/2014

TRANSPORTATION ENGINEERING

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Explain the necessity and objects of highway engineering. 4

   (b) Briefly outline the classification based on location and function as suggested in the Nagpur Road Plan. 5

   (c) What are the uses of fact finding surveys ? How are these used and interpreted ? 5

2. (a) What are the various requirements of an ideal alignment ? Explain the various factors controlling the alignment of road ? 7

[Turn over

(b) Write down the construction steps for water bound macadam road. 7

3. (a) Derive an expression for calculating the overtaking sight distance on a highway. 7

(b) Draw a typical cross-section of the SH in rural area. 4

(c) Define cutback bitumen. Classify the types of cutback bitumen. 3

4. (a) Explain flexible and rigid pavement and bring out the points of difference. 7

(b) The maximum increase in temperature is expected to be 26°C after the construction of the CC pavement. If the expansion joint gap is 2·2 cm, design the spacing between the expansion and contraction joint. Assume plain cement concrete construction with thermal coefficient = 10×10^{-6} per °C, unit weight = 2400 kg/m^3, allowable stress in tension during initial period of curing = 0·8 kg/cm^2 and the coefficient of the interface = 1·4. 7

5. (a) What is super elevation ? Derive an equation for finding the super elevation. 7

(b) Calculate the values of :

(i) Headlight sight distance

(ii) Intermediate sight distance for a highway with a design speed of 65 kmph. Assume f = 0·36, t = 2·5 sec. 7

6. (a) What are the various tests carried out on bitumen ? Briefly mention the principle and uses of each test. 7

(b) What should be the height of the crown wrt to the edge for a major district road of WBM pavement 7·0m wide to be constructed for heavy rainfall ? 3

(c) What do you mean by traffic engineering ? What is the importance of origin and destination studies ? 4