Mid-West University

Examinations Management Office

End Semester Examinations 2081

Bachelor level/ B.E. Hydropower/ 5th Semester | Full Marks: 50
Time: 3 hours | Pass Marks: 25
Subject: Road Engineering (HE306/HE456)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. **a)** Describe the different modes of transportation. Which modes of transportation is suitable for Nepal? Give reasons. **(2+3)**

   b) Explain the Engineering survey to be carried out for a highway alignment. **(3)**

2. **a)** In a region of heavy rainfall a major district road of WBM Pavement is to be constructed. If the width of the road is 3.75m, find the height of the crown with respect to the edges. What would be the height of crown with respect to the edges if 7.5m width bituminous concrete pavement is to be constructed? **(4)**

   b) A vehicle moving at a speed of 65 kmph decided to overtake another slow moving vehicle. Calculate the safe overtaking sight distance. Consider (i) Two lane road with two-way traffic. (ii) Two lanes with oneway traffic. Assume acceleration = 2.5km/hr/sec and total reaction time = 2.54 sec. **(5)**

3. **a)** Calculate the elements of vertical curve from the following data.
   Ascending grade = 3%, Descending grade = 2.5% and radius (R) = 5000m. **(3)**

   b) Write short notes: **(3x1)**
   i) Camber ii) Superelevation iii) Foot Path

4. **a)** Define culverts. Briefly explain the types of culverts with figure. **(1+4)**

   b) How do you decide the suitable aggregates for use in construction? Briefly explain the crushing test of aggregate. **(1+4)**

5. **a)** Explain the types of special structures which frequently used in the hill roads in Nepal. **(5)**

   b) Mentions the differences between flexible and rigid pavement. **(4)**

6. **a)** Calculate the deflection at the surface of a pavement due to a wheel load of 40 KN and tire pressure of 0.5 MN/m^2. The value of E of the pavement and subgrade may be assumed to be uniformly equal to 20 MN/m^2. **(3)**

   b) Briefly explain the construction of Earthern road. **(5)**

The End