Total Pages—4

(Set-R_1)

B.Tech-6th

Transportation Engineering-II

Full Marks : 70

Time : 3 hours

Answer Q. No. 1 and any five questions from the rest

The figures in the right-hand margin indicate marks

Assume suitable data, if required

1. Answer the following questions : 2 × 10

(*a*) What do you understand by adzing of sleepers ? Explain with a sketch.

(*b*) What is track modulus ? List out the factors on which it depends.

(*c*) What would be the gradient for a BG track when the grade resistance together with the curve resistance due to a curve of 4° shall be equal to the resistance due to a ruling gradient of 1 in 150 ?

(Turn Over)

(*d*) Where do we prefer staggered rail joints and why ?

(*e*) What is negative superelevation ? Explain with a neat sketch.

(*f*) What is a triangle as referred to railway junction ? Give a sketch and state its purpose.

(*g*) Where are repeater signals provided ?

(*h*) Why it is preferred for landing and taking-off of aircrafts to take place against the direction of wind ?

(*i*) What do you mean by basic runway length ?

(*j*) What will be the turning radius of a taxiway for a turning speed of 45 kmph and coefficient of friction between tyre and pavement being 0·12 ?

2. (*a*) What are the problems associated with multi-gauge system in a country ?

(*b*) What is creep ? Explain the theories behind it. How it can be prevented ? 10

3. (*a*) State the requirements of good ballast including physical properties, size and gradation.

(*b*) Draw a line of comparison between different types of sleepers. 10

4. (*a*) What do you mean by cant deficiency and cant excess ? State their maximum values for BG. What are the objectives of providing transition curves ?

(*b*) Calculate the maximum permissible speed on a 1° curve with maximum sanctioned speed of 150 kmph, superelevation of 55 mm and maximum transition curve length of 70 m. 10

5. (*a*) Draw a neat sketch of a right hand turn out on a BG track showing on the salient features.

(*b*) State the requirements of an ideal crossing. Calculate on the elements of a 1 in 12 turn out in a BG track with a heel divergence of 110 mm. 10

6. (*a*) State the engineering principles of signalling and give a broad classification of signals used in India Railways. What are the systems used for controlling train movements ?

   (*b*) Describe the various characteristics of aircraft controlling airport planning and design. 10

7. (*a*) Describe the various imaginary surfaces with neat sketches.

   (*b*) The runway lengths required for landing and take-off at sea level in standard atmospheric condition are 2800 m and 2400 m respectively. Airport reference temperature is 25 °C and that of standard atmosphere at airport elevation of 140 m is 15 °C. If the effective runway gradient is 0·4 per cent, determine the length of runway to be provided. 10

8. Write short notes on : 10

   (*a*) (*i*) Holding apron

   (*ii*) Instrumental landing system.

   (*b*) (*i*) Size of gate position

   (*ii*) Characteristics of a good airport layout.
