Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PECI 5304 (New)

Sixth Semester (Back) Examination – 2013

TRANSPORTATION ENGINEERING - II

BRANCH : CIVIL

QUESTION CODE : B324

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

(a) What are the advantages of coning of wheels ?

(b) Write a short note on Hogged rails.

(c) What are the factors affecting the choice of a particular gauge ?

(d) Explain obtuse angle crossing by means of a neat sketch.

(e) Find out the curve resistance, when a curve of 6 degrees is situated on a B.G. line and a train with total weight of 1219.8 tonnes is moving over it.

(f) State the requirements of a good ballast material.

(g) What are the component parts of an aeroplane ?

(h) Draw a neat cross-section of a main taxiway and show various geometrics.

(i) Explain with a neat sketch the various markings on taxiways.

(j) Write a short note on zoning laws.

2. (a) What is meant by wear of rails ? How do you classify wear ? Discuss the suitable measures to reduce the effect of wear on rails. 5

(b) What is creep of rails ? Discuss the theories propounded to explain the probable causes of creep. 5

3. (a) Explain the necessity of sleepers in railway track. What are the desirable qualities or requirements of good sleepers ? 5

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(b) What is the weighted average speed and equilibrium cant on a 2 degree curve on a B.G. track if 15 trains, 10 trains, 5 trains and 2 trains are running at speeds of 50 km.p.h, 60 km.p.h, 70 km.p.h and 80 km.p.h respectively ? 5

4. (a) What are the functions of points and crossings in railway track layout ? Show with a neat sketch different parts of a turnout. 5

(b) Calculate the curve lead, radius, switch lead and lead required to set out a 1 in 8.5 turnout, taking off from a straight B.G. track with its curve starting from the toe of the switch, i.e., tangential to the gauge face of the outer main rail and passes through theoretical nose of crossing. Given, heel divergence as 11.42 cm. 5

5. (a) On what criteria signals are classified ? Explain with neat sketches, the working of the semaphore signals. 5

(b) Compute the steepest gradient that a train of 20 wagons and a locomotive can negotiate given the following data: weight of each wagon = 20 tonnes, weight of locomotive = 150 tonnes, tractive effort of locomotive = 15 tonnes, rolling resistance of locomotive = 3kg/tonne, rolling resistance of wagon = 2.5 kg/tonne, speed of the train = 60 kmph. 5

6. (a) Name the different characteristics of aircrafts. How do they affect the planning and design of airports ? 5

(b) The runway length required for landing at sea level in standard atmospheric condition is 3000 m. Runway length required for takeoff at a level site at sea level in standard atmospheric conditions is 2500 m. Aerodrome reference temperature is 24 °C and that of the standard at aerodrome elevation of 150m is 14.025 °C. If the effective gradient is 0.5 %, determine the runway length to be provided. 5

7. (a) Why is it necessary to plan airports on regional basis ? What data are to be collected for such planning ? 5

(b) Explain Wind Rose Diagram and its significance. Discuss with neat sketches the methods adopted for of analyzing the wind data in obtaining the runway direction. 5

8. (a) Summarize briefly the various runway geometrics as recommended by ICAO. 5

(b) Explain briefly the various factors which affect the layout of a taxiway and enumerate its geometric design standards. 5