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Total number of printed pages – 3

B. Tech
PECI 5304

Sixth Semester Regular Examination – 2015

TRANSPORTATION ENGINEERING - II

BRANCH : CIVIL

QUESTION CODE : J 456

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 functions of rails ?
- (b) Discuss the factors on which the sleeper density depends ?
- (c) Determine the optimum thickness of the stone ballast required below sleepers of density M+7 on a BG track.
- (d) Mention the major requirements of an ideal permanent way.
- (e) Draw a neat sketch to show a point rail and a splice rail.
- (f) What are the engineering principles of signaling ?
- (g) What do you mean by minimum circling radius ?
- (h) Enumerate the factors controlling taxiway layout.
- (i) What do you understand by optimum location of exit taxiway ?
- (j) What are the imaginary surfaces for the airports ?

P.T.O.

2. Explain the necessity of gradients on a railway track. Discuss all the types of gradients. What is the necessity of grade compensation at curves ?
If a 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a BG yard, calculate the superelevation and the speed on the branch line , if the maximum speed permitted on the main line is 45 km/h. 10
3. Differentiate between the hauling capacity and the tractive effort of a locomotive. Give the expression for the Total Train Resistance.
Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22 tonnes each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction of speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a 4° curve on the rising gradient? Assume the coefficient of friction to be 0.2. 10
4. (a) What do you mean by coning of wheels ? Discuss the necessity and effects of coning of wheels and tilting of rails. 5
(b) What is creep ? What are the possible causes and effects of creep ? Explain various preventive and remedial measures that can be taken. 5
5. (a) Explain the necessity of sleepers in railway track. What are the desirable qualities of good sleepers ? What would be the expression for sleeper density if the rail length used in a track is 19m and there are 22 sleepers under one rail length ? 5
(b) What are the functions of points and crossings in railway track layout ? Draw a neat diagram of simple left-hand turnout showing its various component parts. 5
6. (a) Enumerate the various factors which you would keep in view while selecting a suitable site for an airport. 5
(b) What is Minimum Turning Radius and its objective ? Describe with the help of a neat sketch, how to determine the Minimum Turning Radius. 5

7. (a) What is a wind rose diagram ? What is its utility? What are its types ?
Explain each type ? 5
- (b) The length of a runway under standard condition is 1620 m. The airport site has an elevation of 270m. Its reference temperature is 32.9°C. If the runway is to be constructed with an effective gradient of 0.2 percent, determine the corrected runway length. 5
8. Write short notes on any **two** : 5 × 2
- (a) Equilibrium Cant and Cant deficiency
 - (b) Rail failures
 - (c) Component parts of an aeroplane
 - (d) Take-off climb surface.

