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Total number of printed pages – 3

B. Tech  
PCCI 5304

**Sixth Semester Examination – 2013**  
**TRANSPORTATION ENGINEERING – II**

**BRANCH : CIVIL**

**QUESTION CODE : A 265**

**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 very shortly : 2×10
- (i) Explain acute angle crossing by means of a neat sketch.
- (ii) Which portions of the track are more susceptible to creep ?
- (iii) Draw a typical cross-section of a permanent way on embankment showing various components.
- (iv) What are the causes of buckling of rails ?
- (v) Find out the expression for sleeper density for a B.G. track (length of rail 12.8 m), if 19 sleepers are used a rail length.
- (vi) What are the functions of ballast in a railway track ?
- (vii) What do you mean by Fuselage of an aeroplane ?
- (viii) What are the different groups of airport markings ?
- (ix) Write a short note on holding aprons.
- (x) What are the assumed conditions for basic runway length ?

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2. (a) What is coning of wheels ? Discuss the necessity and effects of coning of wheels and tilting of rails. 5
- (b) What do you mean by creep ? What are the possible causes and effects of creep ? What are various preventive and remedial measures that can be taken ? 5
3. (a) Describe the functions and requirements of rails in a railway track. What are different types of rail sections used for construction ? 5
- (b) 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 kmph. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. 5
4. (a) Draw a neat diagram of simple left-hand turnout and show its various component parts. Explain the working principle of the turnout. 5
- (b) Calculate the curve lead, radius, switch lead and lead required to set out a 1 in 12 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 11.4 cm. 5
5. (a) What are the objects of signalling in railway systems ? Describe the Engineering principles of signalling. 5
- (b) A 6 degree curve track diverges from a main curve of 3 degree in an opposite direction in the layout of a B.G. yard. If the speed on the branch line is limited to 35.5 kmph, determine the restricted speed on the main line. Given cant deficiency as 7.62 cm. 5
6. (a) Differentiate between Minimum Turning Radius and Minimum Circling Radius. Explain their importance in planning and designing of airports. 5

- (b) The length of runway under standard conditions is 1620 m. The airport site has an elevation of 270 m. Aerodrome reference temperature is  $32.90^{\circ}\text{C}$ . If the runway is to be constructed with an effective gradient of 0.20%, determine the corrected runway length. 5
7. (a) What is Wind Rose Diagram ? What is its utility ? What are its types ? Explain each type. 5
- (b) What are imaginary surfaces and their significance ? Draw a neat sketch of a schematic view of imaginary surfaces. 5
8. (a) Enumerate the various factors which you would keep in view while selecting a suitable site for an airport. 5
- (b) Explain the various factors which affect the locations of exit taxiway. What do you understand by optimum location of exit taxiway ? 5

