Registration no: | | | | | | | | | | |

Total Number of Pages: 02 **B.Tech**
PECI5304

6th Semester Regular / Back Examination 2015-16
TRANSPORTATION ENGINEERING - II
BRANCH: CIVIL
Time: 3 Hours
Max Marks: 70
Q.CODE: W555

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

Q1 Answer the following questions: **(2 x 10)**

a) What are the different types of rail section used on BG and MG tracks? Mention their speed limit.

b) Differentiate between cant deficiency and cant excess.

c) What is the necessity of rail joint? Why staggered joints are provided on a horizontal curve?

d) Define sleeper density. What is the minimum spacing between the sleepers for packing of ballast?

e) Where the check rails are provided particularly at the horizontal curve and why?

f) What is grade compensation? What are the different values of grade compensation in India for different gauge in terms of radius of curve?

g) Define T.N.C and A.N.C

h) Define calm period. What is the necessity of calm period for orientation of runway?

i) Define cross wind component. What are the permissible limits as per FAA and ICAO.

j) What is code Beacon? Why it is provided in Airport?

Q2 **a)** A 4-10-2 locomotive is required to haul a train at a speed of 96 kmph. The train is made to run on a straight level track with an axle load of driving wheels of the engine is 22.84 tonne each. **(5)**

i. Calculate the maximum permissible load that can be pulled by the engine

ii. What should be the reduction in speed, if the train has to ascend a slope of 1 in 150 with a 3º curve?

b) Compare the flat footed rails with Bull-headed rails and Double-headed rails. **(5)**

Q3 **a)** Calculate the maximum permissible speed on a 1º 15' curve of high speed B.G. track with maximum sanctioned speed of 155 kmph decided by additional commissioner of Railway. The superelevation provided is 60mm and the length of transition curve is 145 m. **(6)**

b) Determine the extra width required on a 5º horizontal curve for MG track, if the wheel base of a vehicle moving on MG track is 4.88m , the diameter of wheel is 0.8m and the depth of flanges below the top of rail is 3.2cm **(4)**

Q4 **a)** Calculate the elements of 1 in 12 turnout on a straight BG track by IRS method, when it is given, angle of switch is 1º 8'15", heel divergence is 13 cm and the straight length of arm at crossing is 0.9 m. **(5)**

b) What are the requirements of good crossing? Explain various types of crossings in used on Indian Railways. **(5)**

Q5 **a)** The length of the runway for landing and take-off under standard conditions is 2800 m and 2300m respectively. The airport is to be provided at an elevation of 250 m above the mean sea level. The mean of maximum daily temperature and mean of average daily temperature of an airport is 48ºc and 32ºc respectively. If the runway is to be constructed with an effective gradient of 0.3 %, determine the corrected runway length to be provided as per ICAO and FAA. **(6)**

b) Explain briefly the factors which depend on location of exit taxiway? **(4)**

Q6 **a)** Determine the turning radius of the taxiway for operating Boeing 707-320, having wheel base 17.7m, tread of main loading gear is 6.62m, coefficient of friction between tire and pavement surface is 0.13m, turning speed of aircraft is 35kmph and the width of taxiway pavement is 22.5m. **(4)**

b) Explain briefly the various geometric elements of runway for the airport design as recommended by ICAO. **(6)**

Q7 **a)** What are the objects of signaling? Explain clearly the location and function of shunting signals. **(5)**

b) Explain briefly the problems cause by multi-gauge system in Indian Railway. **(5)**

Q8 Write short notes on any two: **(5 x 2)**

a) Pre-stressed concrete sleeper
b) Runway lighting
c) Fish Plate
d) Wind direction indicator