Note: (i) Attempt ALL questions.
(ii) All Questions carry EQUAL marks.
(iii) In case of numerical problems assume data whenever not provided.
(iv) Don’t write any thing on the question paper except your roll no.

Q1. Attempt any FOUR of the following: 5x4=20

a) What do understand by the coning of wheels?

b) Give the expression of cant for railway track

c) What is the requirement of ideal transition curve?

d) What do you mean by equilibrium cant and negative super elevation?

e) What is the function of sleeper?

f) Using the sleeper density of M+5, find out the number of sleeper required for constructing a railway track 700m long (B.G. track)

(1)
Q.2. Attempt any TWO of the following: 10X2=20
   
a) What are the factors to be considered in selection of a gauge? Write advantage of uniformity of gauges?
   
b) Define cant deficiency. If a 4° branch track is diverted in opposite direction from a 3° main track (both are BG). If maximum speed allowed on main track is 80Kmph. What maximum speed can be allowed on branch track?
   
c) What do you understand by widening of railway track? Calculate the shift and offset at every 15m of a transition curve. The transition curve of 90m long is to be used to join the ends of 4° circular curves within the straight and circular curve.

Q.3. Attempt any TWO of the following: 10x2=20
   
a) What are the different systems of controlling the movement of trains? Explain the system which is widely used in Indian railways.
   
b) Explain the permanent way or railing track with a neat diagram.
   
c) What is the ballast in permanent way? Mention the function of ballast and state the requirement of a good ballast material.

Q.4. Attempt any TWO of the following: 10x2=20
   
a) Explain what you understand by tractive effort of a locomotive and derive the expression for the same.
   
b) Discuss the different types of sleeper in use on Indian Railway and state relative merit and demerit of

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each. Which type of sleeper and of what material do you consider the best and why?

c) Write a short note on:
   i) Broad gauge
   ii) Coaches
   iii) Creep of rails
   iv) Fish plates
   v) Hauling capacity

Q.5. Attempt any TWO of the following:- 10x2=20

a) What are the functions of railway station? Describe the factors that influence the selection of site for a railway station.

b) Find out the length of the curves for a B.G curved track having 4° curvatures and a cant of 12cm. the maximum permissible speed on curve is 85kmph.

c) Runway length required for landing at sea level in standard atmospheric condition is 2110m. Runway length required for lake off at a level in standard atmospheric condition is 2550m. Aerodrome elevation is 200m and reference temperature is 24°C. Temperature in the standard atmosphere for 200m is 15°C and runway slope is 0.5%. Determine the length of the runway after applying correction to runway length.

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