



**Seventh Semester B.E. (Civil) Degree Examination, June/July 2016
(2K11 Scheme)**
CE – 704 : TRANSPORTATION ENGINEERING — III

Time : 3 Hours

Max. Marks : 100

Instructions : 1) Answer **five full questions, selecting three questions from Part – A and one question each from Part – B and C.**
2) Assume **suitable data if necessary.**

**PART – A
(Railway Engineering)**

1. a) Draw a typical cross section of a B.G. double line track in an embankment. Mention the component parts with dimensions and explain the functions of each. 10
b) Explain with sketches, the various types of rail failures. 10
2. a) Discuss the different types of sleepers in use on Indian railway and state relative merits and demerits of each. 10
b) Compare the different ballast materials with reference to merits, demerits and suitability of each materials to be used as ballast. 10
3. a) What are the various resistance to traction ? How the magnitude of resistance estimated ? 10
b) Calculate the maximum permissible train load that can be pulled by a locomotive having four pairs of driving wheels carrying an axle load of 22 tonnes each. The train has to run at a speed of 90 kmph on straight level track (BG). Also calculate the reduction in speed, if the train has to climb a gradient of 1 in 200 and if the train claims the gradient with a 2° curve, then what would be the reduction in speed ? 10
4. a) What are the objectives of providing transition curves in railways ? Explain how the length of transition curve is decided. 10
b) Calculate all the elements required to set out a 1 in 12 turnout taking off from straight B.G. track with its curve starting from the toe of the switch i.e. tangential to the gauge face of the main rail and passes through TNC. Given that the heel divergence is 12.1 cm. 10



5. a) Draw a neat diagram of a simple right hand turn out and indicate various parts. Explain the working principle of the turn out that you have drawn. **10**
- b) What is permanent way ? Discuss the ideal requirements and functions of a permanent way. **10**

PART – B
(Tunnel Engineering)

6. a) What is a Tunnel ? What are the advantages of adopting a Tunnel as a means of communication ? **10**
- b) Explain the method of transferring of centerline from the surface to underground, inside the tunnel with suitable sketch. **10**
7. a) Sketch and explain the sequences of tunneling by “Fore polling method”. **10**
- b) What are the functions of tunnel ventilation system and explain the mechanical method of tunnel ventilation with suitable sketches ? **10**

PART – C
(Harbour Engineering)

8. a) Explain briefly the various factors to be considered while selecting the site for the construction of harbour. **10**
- b) Given a fetch of 16 nautical kms, a wind speed of 25m/sec and a mean water depth of 6 m, determine the wave height and wave length. **6**
- c) Explain briefly dry dock. **4**
9. a) Explain with suitable sketches (any two), the different types of break waters that are commonly constructed in harbour. **10**
- b) Explain the following with sketches : **10**
- i) Light house.
- ii) Warehouse and transit shed.
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