

Enrollment No.....



Faculty of Engineering
End Sem (Odd) Examination Dec-2017
CE3EL07 Transportation Bridges & Tunnels
 Programme: B.Tech. Branch/Specialisation: CE

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. For a broad gauge route with M+7 sleeper density, number of sleepers per rail length is: **1**
 (a) 18 (b) 19 (c) 20 (d) 21
- ii. Coning of wheels: **1**
 (a) Prevent lateral movement of wheels
 (b) Provide smooth running surface
 (c) Avoid excessive wear of inner faces of rail
 (d) All of these
- iii. Cant deficiency occurs when a train travels around a curve at: **1**
 (a) Equilibrium speed
 (b) Speed higher than equilibrium speed
 (c) Speed lower than equilibrium speed
 (d) Booked speed
- iv. Normally maximum cant permissible in Meter Gauge is: **1**
 (a) 75 mm (b) 90 mm (c) 140 mm (d) 165 mm
- v. The angle between the gauge faces of the stock rail and tongue rail, is called: **1**
 (a) Angle of crossing (b) Switch angle
 (c) Angle of turnout (d) None of these
- vi. As per ICAO, the minimum basic runway length for A and E type of airport will be: **1**
 (a) 1500-600 m (b) 2100-750 m
 (c) 1500-750 m (d) 2100-600 m
- vii. Which of the following components is not a sub structure: **1**
 (a) Pier (b) Foundation
 (c) Deck slab (d) Abutment

- viii. Which is not a type of wing wall: **1**
 (a) Straight (b) Return (c) Splayed (d) Non return
- ix. To attain the required shape of the tunnel section, we use: **1**
 (a) Easers (b) Trimmers (c) Cut holes (d) Chisels
- x. In case of drift method of tunnelling, the drift may be excavated at: **1**
 (a) Centre (b) Bottom (c) Top (d) All of these

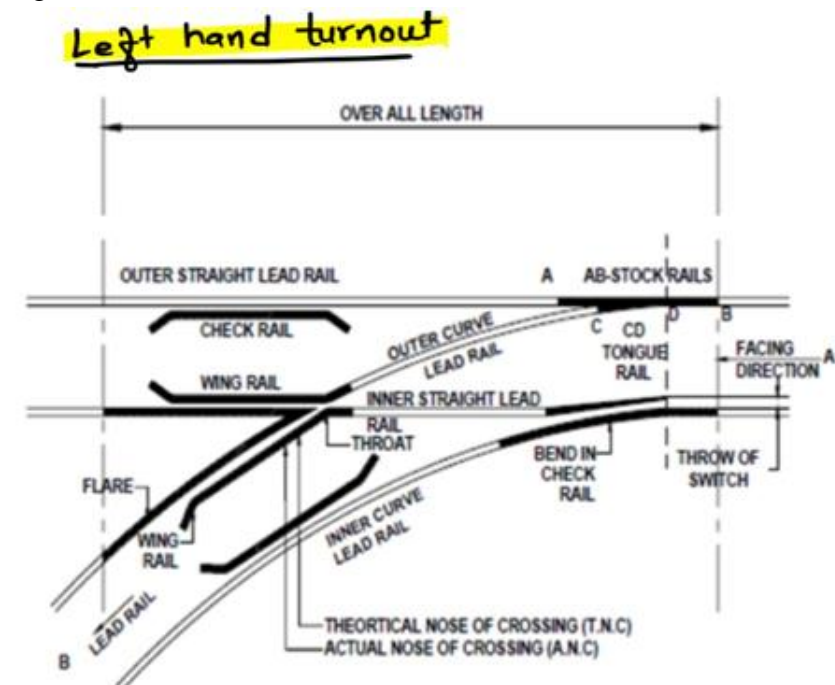
- Q.2 Attempt any two:
- i. Explain different types of train resistance in detail. **5**
- ii. Explain various types of ballast material used in railways in detail. **5**
- iii. What are various types of sleepers? Explain each type in detail. **5**
- Q.3 i. What is grade compensation on curve? **2**
 ii. What is super elevation? Derive the derivation for the same. **8**
 Also explain negative super elevation.
- OR iii. Write detailed note on stress in rails and sleepers. **8**
- Q.4 i. Draw a neat sketch of left hand turnout and mention its components. **3**
 ii. What is railway yard? Describe various types in detail with neat sketches. **7**
- OR iii. Explain various airport lighting in detail with diagrams. **7**
- Q.5 i. What are various points you should keep in mind while selecting site for a bridge. **4**
 ii. What is economic span? Derive the relation for the same. **6**
- OR iii. Write short note on : **6**
 (a) Afflux (b) Scour depth (c) Cofferdam
- Q.6 Attempt any two:
- i. Write short note on various shapes and sizes of tunnels with neat sketch. **5**
- ii. Explain different types of lining used in railway tunnel. **5**
- iii. Write short note on: **5**
 (a) Mucking operation (b) Pilot shaft

P.T.O.

Marking Scheme

- Q.1 i. For a broad gauge route with M+7 sleeper density, number of sleepers per rail length is: **1**
 (c) 20
- ii. Coning of wheels: **1**
 (d) All of these
- iii. Cant deficiency occurs when a train travels around a curve at: **1**
 (b) Speed higher than equilibrium speed
- iv. Normally maximum cant permissible in Meter Gauge is: **1**
 (b) 90 mm
- v. The angle between the gauge faces of the stock rail and tongue rail, is called: **1**
 (b) Switch angle
- vi. As per ICAO, the minimum basic runway length for A and E type of airport will be: **1**
 (d) 2100-600 m
- vii. Which of the following components is not a sub structure: **1**
 (c) Deck slab
- viii Which is not a type of wing wall: **1**
 (d) Non return
- ix. To attain the required shape of the tunnel section, we use: **1**
 (b) Trimmers
- x. In case of drift method of tunnelling, the drift may be excavated at: **1**
 (d) All of these
- Q.2 Attempt any two:
- i. Types of train resistance - 1 mark for each **5**
 (1 mark * 5 = 5 marks)
- ii. Types of ballast material used in railways - 1 mark for each **5**
 (1 mark * 5 = 5 marks)
- iii. Types of sleepers – 1 mark **5**
 Explanation of each type – 1 mark each (1 mark * 4 = 4 marks)
- Q.3 i. Grade compensation on curve **2**
- ii. Super elevation – 2 marks **8**
 Derivation - 3 marks
 Negative super elevation – 2 marks
 Diagram of negative super elevation – 1 mark
- OR iii. Stress in rails - 4 marks **8**
 Stress in sleepers – 4 marks

- Q.4 i. Diagram of left hand turnout and its components. **3**



- ii. Railway yard – 1 mark **7**
 Types with neat sketches – 6 marks [Types without sketches – 3 marks]
- OR iii. Airport lighting with diagrams – 1 mark for each (1 * 7 = 7 marks) **7**
 [Airport lighting without diagrams – ½ mark for each]
- Q.5 i. Points on selecting site for a bridge ½ mark for each **4**
 (½ mark * 8 = 4 marks)
- ii. Economic span – 1 mark **6**
 Relation for the same – 5 marks
- OR iii. Write short note on : 2 marks each (2 marks * 3 = 6 marks) **6**
 (a) Afflux (b) Scour depth (c) Cofferdam)
- Q.6 Attempt any two:
- i. Shapes and sizes of tunnels with neat sketch. **5**
 5 shapes – ½ mark each with sketch (0.5 * 5 = 2.5 marks)
 Size of 2-lane highway tunnel – 2 ½ marks
- ii. Explain different types of lining used in railway tunnel. **5**
 5 methods with diagram – 1 mark each
 [5 methods without diagram – ½ mark each]
- iii. Write short note on: 2 ½ marks each (2 ½ marks * 2 = 5 marks) **5**
 (a) Mucking operation (b) Pilot shaft
