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18CV645

Sixth Semester B.E. Degree Examination, Jan./Feb. 2023
Railways, Harbour, Tunneling and Airports

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1　a. With a neat sketch of permanent way cross section, explain the function of its components. **(10 Marks)**

　　b. If a 6° curve track branches off from a main 4° curve in an opposite direction in a layout of B.G. yard, calculate the superelevation and the speed on the branch line if the maximum speed on the main line is restricted to 45 kmph. **(10 Marks)**

OR

2　a. With a neat sketch, explain the Coning of wheels. Also, mention any two advantages of it. **(10 Marks)**

　　b. Draw a neat sketch of simple right hand turnout and show its various components. Also, explain the working principle of the turnout. **(10 Marks)**

Module-2

3　a. Discuss in detail about modern methods of track maintenance. **(10 Marks)**

　　b. Estimate the quantities of materials required per km length of B.G track. Given weight of rail per metre as 45×10^{-2} kN/m, length of rail as 12.8m, sleeper density = (n + 5). **(10 Marks)**

OR

4　a. Enumerate the different types of station yards. With a neat sketch, explain Marshaling yard. **(10 Marks)**

　　b. Enumerate and explain the methods of stabilization of track on poor soil. **(10 Marks)**

Module-3

5　a. Classify the types of harbour and explain the natural phenomena considered in the design of harbor. **(10 Marks)**

　　b. Explain: (i) Tunnel Lighting　　(ii) Tunnel Ventilation **(10 Marks)**

OR

6　a. Enumerate and explain different types of breakwaters. **(10 Marks)**

　　b. With a neat sketch, explain Needle beam method of tunneling. **(10 Marks)**

Module-4

7　a. Sketch a typical airport layout and explain the function of its components, **(10 Marks)**

　　b. Discuss on the classification of Airports. **(10 Marks)**

OR

8　a. Explain the factors considered in the selection of site for airport. **(10 Marks)**

　　b. Write short notes on:
　　　i) Air transport characteristics　　　ii) Parking and circulation area **(10 Marks)**

Module-5

9 a. The length of runway under standard condition is 1620m. The airport site has an elevation of 270m. Its reference temperature is 32.94°C. If the runway is to be constructed with an effective gradient of 0.2 percent, determine the corrected runway length.   (10 Marks)

   b. What is wind rose diagram? With a neat sketch explain any one method of orientation of runway.   (10 Marks)

OR

10 a. Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turnoff speed is 80 kmph. Draw a neat sketch and show all the design elements.   (10 Marks)

   b. Explain
       (i) Airport Lighting
       (ii) Airport Marking   (10 Marks)

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