**20CE703/PE**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | |
| **January, 2024** | | **Civil Engineering** | | |
| **Seventh Semester** | **Railway & Airport Engineering** | | | |
| **Time:** Three Hours | | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | | **(4X14=56 Marks)** |

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|  |  |  | CO | BL | M |
| 1 | a) | Define permanent way. | CO 1 | L1 | 1M |
|  | b) | Define fish plate. | CO 1 | L1 | 1M |
|  | c) | What is the purpose of welding of rails? | CO 1 | L1 | 1M |
|  | d) | Define ballast. | CO 1 | L1 | 1M |
|  | e) | What is grade compensation? | CO 2 | L1 | 1M |
|  | f) | What is level crossing? | CO 2 | L1 | 1M |
|  | g) | What is roaring of rails? | CO 2 | L1 | 1M |
|  | h) | What is negative super elevation? | CO 2 | L1 | 1M |
|  | i) | Define apron. | CO 3 | L1 | 1M |
|  | j) | Define wind rose. | CO 3 | L1 | 1M |
|  | k) | Define runway orientation. | CO 3 | L1 | 1M |
|  | l) | Define port. | CO 4 | L1 | 1M |
|  | m) | What is transit shed? | CO 4 | L1 | 1M |
|  | n) | What are navigational aids? | CO 4 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | What is permanent way? Draw a neat sketch and explain requirements of ideal permanent way. | CO 1 | L1 | 7M |
|  | b) | Discuss different types of rail joints with the help of neat sketch. | CO 1 | L1 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Differentiate roadways with railways. | CO 1 | L3 | 7M |
|  | b) | Define Coning of Wheel & Derive an equation for it with neat sketches. | CO 1 | L1 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Write a note about (i) Momentum gradient and  (ii) Pusher or Helper gradient | CO 2 | L1 | 7M |
|  | b) | Derive an expression to establish relationship among gauge, speed, radius of curvature and super elevation. | CO 2 | L2 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Draw a neat sketch of Right hand turnout. List various parts of turnout. | CO 2 | L2 | 7M |
|  | b) | A 50curve diverges from 30 main curve in reverse direction in the layout of a B.G. yard .If the speed on the branch line is restricted to 35 Km.p.h. determine the restricted speed on the main line. | CO 2 | L3 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Discuss various components of aeroplane with neat sketches. | CO 3 | L2 | 7M |
|  | b) | List out the factors to be considered in site selection of an airport. | CO 3 | L1 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Compute the corrected runway length for the basic runway length of 1600 m. if it is to be provided at an altitude of 450 m above MSL, the airport reference temperature is 32°C and the effective gradient is 1.4%. Apply the necessary checks. | CO 3 | L3 | 7M |
|  | b) | What is Wind Rose diagram? How it is used for finalizing the runway orientation at a given location? | CO 3 | L1 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | What are the various Factors Affecting Pavement design? | CO 4 | L2 | 7M |
|  | b) | Explain about CBR method of pavement design. | CO 4 | L2 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Discuss various components of harbour with neat sketch. | CO 4 | L2 | 7M |
|  | b) | Explain about various types of break waters. | CO 4 | L2 | 7M |

