**14CE702**

**Hall Ticket Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **January, 2021** | **Civil Engineering** | | |
| **Seventh Semester** | **Design of Steel Structures - II** | | |
| **Time:** Three Hours | | **Maximum :** 60 Marks | |
| *IS: 800-2007, IS: 875(Part-3), Steel Tables are permitted* | | |  |
| *Answer* ***ANY FIVE*** *questions from the following.* | | | (5X12=60 Marks) |

|  |  |  |
| --- | --- | --- |
|  | | |
| 1 | Design a gantry girder to be used in an industrial building carrying an EOT crane for the  following data:  Crane capacity = 200 kN.  Total self weight of all components = 240 kN.  Minimum approach at the carne hook of gantry girder = 1.2m  Wheel base = 3.5m C/C distance between gantry rails = 16m C/C  distance between columns = 8m  Self weight of rail section = 300 N/m  Yield stress = 250 N/mm2  Design the main gantry section. Connection design not required. | 12M |
|  | | |
| 2 | A gantry girder carrying an electrically operated crane of capacity 250kN along with trolley 75kN. Span of gantry is 6m, span of crane is 20m, wheel base is 3.5m, and hook approach is 1m. Assume any suitable data. Determine Maximum moment and shear forces due to vertical and horizontal loads. Check ISMB600 with ISMC300 on compression flange is adequate to carry moment, shear and deflections. | 12M |
|  | | |
| 3 | Deign a welded plate girder for a simply supported beam with clear span of 25m, subjected to the dead load including self-weight = 22kN/m, Imposed load = 12kN/m. Assume compression flange is laterally restrained. Design a unstiffened plate girder with thick webs. Design end bearing stiffeners. | 12M |
|  | | |
| 4 | Design a welded plate girder for an effective span of 32 m and carrying a uniformly distributed load of 25 kN/m with two concentrated loads 150 kN each at 10 m from either ends. Assume that the top compression flange is restrained laterally. Use Fe415 grade steel. Design as stiffened plate girder with thick web. | 12M |
|  | | |
| 5 | Find out D.L.,L.L and WL on the roof truss of an industrial building having span of 18 m provided of spacing of 3.2 m c/c which is required to construct in Vijayawada. Consider G.I sheets as a roof covering. Eaves height is 8 m above ground level. Also design the purlin. | 12M |
|  | | |
| 6 | Fix suitable configuration of truss for the following data and calculate nodal forces due to DL,LL and WL Span= 28 m, Pitch of truss = 1/4, Location-Hyderabad. | 12 M |
|  | | |
| 7 | Design the following for an elevated pressed Steel rectangular water tank to store 90000 liters water.  (a) Bottom plates (b). Side plates (c) Stays (d) Upper tier beams (longitudinal beams) € lower tier beams (cross beams) Assume any suitable data. | 12M |
| **P.T.O.**  **14CE702** | | |
| 8 | Design a supporting tower for the following data:  a. height of the tower is 12m from ground level.  b. horizontal acceleration is 6%.  c. tank container size is 6.75x6.75x 2.5m.  d. use ISMB600 as cross beams.  e. use ISLB550 as longitudinal beams.  f. use Angle sections as bracings (horizontal and vertical).  g. reactions from cross beams = 290kN.  Assume any suitable data. | 12M |
| 9 | Design a beam-column of length 4.5m if it carries a compressive load of 800kN, a major axis moment of 10kN.m and a minor axis moment of 8kN.m. Assume any suitable data. Taking effective length factor = 1.2. The column is free to buckle in any plane | 12M |
|  | | |
| 10 | Design a suitable slab base for a column ISHB350 supporting an axial load of 1200kN. The base plate is to rest on a concrete pedestal of M25. | 12M |

****