Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code : 14CE2037** |  | **Duration :** | **3hrs** |
| **Sub. Name : ADVANCED DESIGN OF STEEL STRUCTURES** |  | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Show flexible connections with a neat sketch. | CO1 | 4 |
| b. | An ISLB 300 @ 369.8 N/m transmits an end reaction of 300 kN, under factored load, to the web of ISMB 450 @ 710.2 N/m. Design a bolted framed connection. Steel is of grade Fe 410 and bolts are of grade 4.6. Assume relevant data if required. | CO2 | 16 |
| (OR) | | | | |
| 2. | a. | Write short notes on connections subjected to eccentric shear | CO1 | 3 |
| b. | Design an unstiffened seat connection between a beam of section ISMB 300 and a column ISHB 350 for a reaction of beam 200kN,using M20 bolts of property class 4.6.Take Fe 410 grade steel, Take clearance as 5mm. | CO2 | 17 |
|  |  |  |  |  |
| 3. |  | Design a stiffened seat angle for a reaction of 250kN from a beam of ISMB 400 using M20 bolts of grade 4.6.The beam has to be connected to ISHB 300.Assume Fe 410 grade steel, Take clearance as 5mm. | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Differentiate stiffened and unstiffened seat connection. | CO1 | 3 |
| b. | Write the step by step procedure for design of unstiffened welded seat connection. | CO2 | 17 |
|  |  |  |  |  |
| 5. | a. | Design a rafter bracing of fink type roofing system for the following data.  Length of the bracing = 9.8m  Design tensile force = 13.8kN  Connect the bracing system with truss member using 2no of 16mm diameter bolts. | CO2 | 15 |
| b. | Explain the major components of an industrial building with the help of neat sketches. | CO2 | 5 |
| (OR) | | | | |
| 6. |  | Design an I section roof purlin for a fink type roof truss to suit the following data   1. Length of the building =40m 2. Width of the building =20m 3. Center to center spacing of truss = 5m 4. Span of the truss =16m 5. Rise of the truss = 4m   Roofing and side covering is done by asbestos cement sheet and the building is located in an Industrial area with an inclination of 30oboth ends of the truss are hinged. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Briefly explain steel Chimney , types and various components of self supporting chimney with neat sketches. | CO2 | 10 |
| b. | Explain lattice tower configurations and bracings with the help of neat sketches. | CO2 | 10 |
| (OR) | | | | |
| 8. |  | A 60 m high microwave antenna lattice tower is to be built near Alahabad where the terrain at the site is nearly a level ground with terrain of category 1. The diameter of the Hemi-spherical antenna disc, fixed at the top is 3m. The width of the tower at the top has to be 3m. Select a suitable configuration for the tower and calculate the lateral load for the following data:  Weight of antenna & fixtures : 11kN  Weight of platform at top : 0.92 kN/m2  Weight of railing at top : 0.35 kN/m2  Weight of ladder and the cage : 0.8 kN/m  Weight of Miscellaneous items: 3 kN (such as beacon, lights, lightening cables etc.) Assume relevant data if required. | CO2 | 20 |
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|  | | **Compulsory**: |  |  |
| 9. |  | Design a simply supported composite beam with 9 m span and spaced at 3.5 m. The thickness of the slab is 125 mm. The floor is to carry an imposed load of 3 kN/m2 and floor finish load of 0.5 kN/m2. Take construction load as 0.75 kN/m2. fck = 30 N/mm2 and fy= 250 N/mm2. Assume relevant data if required. | CO3 | 20 |