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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14CE2013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DESIGN OF STEEL STRUCTURES** | **Max. marks :** | **100** |

**(IS 800-2007, IS SP 6-1/Steel tables book are permitted)**

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | | **Marks** |
| 1. | a. | Can you state how an I section and a hollow circular tubular section be classified as per the code. | CO1 | | 5 |
| b. | Determine the maximum load on a steel flat 200 x 10mm having 3 bolts of M20 bolts in 22mm holes in two rows, connected to gusset plate of 10mm thick as shown in the Fig. 1.    Fig.1 | CO2 | | 15 |
| (OR) | | | | | |
| 2. | a. | How would you decide on the safety requirements of tension members with regard to IS 800-2007? | CO1 | | 5 |
| b. | Design a suitable longitudinal fillet weld to connect the plates as shown in Fig. 2 to transmit a pull equal to the full strength of small plate. Given: Plates are 12mm thick, grade of plates Fe 410 and welding to be made in workshop.    Fig.2 | CO2 | | 15 |
|  |  |  | |  |
| 3. | a. | What value would you choose for the effective length of a compression member for different support conditions? | CO1 | | 5 |
| b. | Calculate the maximum tension allowed on a single angle ISA 100 × 100 × 8 if it is connected on one side of gusset plate of 10 mm thick with bolts of 22mm diameter. Bolt strength is 47 kN per bolt. End distance is 40mm and pitch for bolts is 60mm | CO2 | | 15 |
| (OR) | | | | | |
| 4. | a. | Can you bringout how would you choose the effective length of compression members for different support conditions. | CO1 | | 5 |
| b. | Enumerate the design procedure of a battened column. | CO2 | | 15 |
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| 5. | a. | Under which cases resistance to lateral buckling need not be checked in Laterally unsupported beams. | CO1 | | 5 |
| b. | Determine the maximum concentrated working load P that can act at mid span of the simply supported span of 12m made of ISMB600. Lateral supports exist at the ends and mid span. | CO2 | | 15 |
| (OR) | | | | | |
| 6. | a. | Compare the different types of base plates with respect to their applications. | | CO1 | 5 |
| b. | Suggest a suitable column base for an ISMB 250 column section to bear a load of 600 kN (factored) reaction. Design the base plate to be supported on a pedestal of M20 grade of concrete | | CO3 | 15 |
|  |  |  | |  |  |
| 7. | a. | Can you recall the practical applications of Gantry Girders | | CO3 | 3 |
|  | b. | A simply supported beam made of a Plate Girder of span 6m supports uniformly distributed load of w kN/m over its entire span. The compression flange is restrained throughout. Determine the factored value of ‘w’ for the cross section shown in Fig. 3  C:\Documents and Settings\staff\Desktop\Chapter 9\23.png  Fig.3 | | CO2 | 17 |
| (OR) | | | | | |
| 8. | a. | How would you explain the wind load calculations with respect to various coefficients/factors with respect to different locations. | CO3 | | 5 |
| b. | Design a suitable purlin for the pratt truss shown in Fig. 4.  fig.4.jpg .jpg  Fig.4 | CO2 | | 15 |
|  | | **Compulsory:** |  | |  |
| 9. | a. | A hall of clear dimensions 20m x 8m is to be covered with RCC slab flooring 120mm thick resting over Rolled steel beams. Terrazzo finishing 20mm thick is to be provided over the RCC slab. The live load on the slab is 3kN/m2. The beams are resting over 300mm thick columns. Design the floor beams by taking the unit weight of RCC and finishing as 25kN/m3 and 22kN/m3 respectively. | CO2 | | 20 |
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ALL THE BEST