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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14CE3009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED DESIGN OF METAL STRUCTURES** | **Max. marks :** | **100** |

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

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| **Q. No.** | **Questions** | | **Course**  **Outcome** | Marks |
| 1. | Design a laterally restrained simply supported beam of span 6m carrying dead load of 12 kN/m and live load of 8kN/m from RCC slab. Use Fe 410 grade steel. Assume the relevant design data. | | CO2 | 20 |
| (OR) | | | | |
| 2. | Design a bolted stiffened seat connection to join ISMB 400 @ 61.5kg/m with a column section ISHB 450@ 92.5kg/m. The beam transmits an end reaction of 500kN due to factored loads. Bending moment due to eccentricity – 50kNm, Use Fe 410 grade steel. Assume the relevant design data. | | CO2 | 20 |
| 3. | Check the moment carrying capacity of laterally unrestrained beam section ISMB 450 @ 92.5kg/m | | CO1 | 20 |
| (OR) | | | | |
| 4. | Design a laterally restrained column in a building frame of 4m height, Column subjected to the following loads. Assume the relevant design data.  Factored Axial load in compression = 750 kN  Factored Moment in Z-Direction = 160 kN-m | | CO2 | 20 |
| 5. | Analyse the truss for the following data  Span - 16m, Rise – 3m, Spacing of the truss – 4m, Assume the relevant data | | CO2 | 20 |
| (OR) | | | | |
| 6. | Design the Purlin to bear the weight of GI sheets and the wind intensity of 39m/s for the following data. span of purlin 5m, spacing of the purlin 1.5m, roof angle 20deg, Assume the channel section purlin. | | CO2 | 20 |
| 7. | Write the conceptual design of welded plate girder as per Indian standard. | | CO3 | 20 |
| (OR) | | | | |
| 8. | Determine the axial load capacity of builtup column for the following data. Width of flange - 250mm, Thickness of flange – 25mm, Depthe of web – 450mm, Thickness of web – 16mm. Length of column – 5m, fy – 250Mpa. Both the ends of columns are fixed. | | CO2 | 20 |
| **Compulsory:** | | |  |  |
| 9. |  | A three story steel building shown in figure is located in seismic zone III on medium soil. The framing system of the building is moment-resisting frames without brick masonry infill panels. Analyze the building and find the base shear along with its distribution.  Size of the building - 20X12 m  Total height of the building – 9m  Bay width in X-dir – 5m  Bay width in Y-dir – 4m  Bay height in Z-dir – 3m (height)  Slab: 100mm thick RCC slab on all floors, Live load - 2.5kN/m2  Column sections: Ground floor: ISHB 300  Beam sections: Along 20m beams (B1) ISMB 250  All other beams (B2): ISMB 225 | CO2 | 20 |

ALL THE BEST