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 :** | **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. | Write the step by step procedure for the design of welded connection under axial load condition. | CO1 | 10 |
| b. | List out the advantages and disadvantages of welded connections. | CO1 | 5 |
| c. | List the possible modes of failure of bolted connection with neat sketches. | CO1 | 5 |
| (OR) | | | | |
| 2. |  | An ISLB 300 @ 369.8 N/m transmits an end reaction of 350kN, 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. | CO1 | 20 |
| 3. |  | Design a unstiffened seat connection for a factored beam end reaction of 100 kN. The beam section is ISMB 250 @ 365.9 N/m connected to the flange of column section ISHB 200 @ 365.9 N/m using bolted connection. Steel is of grade Fe 410 and bolts of grade 4.6. | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Write the step by step design procedure for stiffened seat connection with a neat sketch. | CO1 | 10 |
|  | b. | Explain the types and major components of a roof truss with the help of neat sketches. | CO 2 | 10 |
| 5. | a. | Write the step by step design procedure for purlin subjected to wind load . | CO 2 | 15 |
|  | b. | Write short note on composite structures. |  | 5 |
| (OR) | | | | |
| 6. | a. | Differentiate web buckling and web crippling. | CO 2 | 4 |
|  | b. | Briefly explain web crippling with neat sketches. | CO 2 | 6 |
|  | c. | Explain the major components of an industrial building with the help of neat sketches. | CO3 | 10 |
| 7. |  | A 60 m high microwave antenna lattice tower is to be built near Agra where the terrain at the site is nearly a level ground with terrain of category 2. The diameter of the Hemi-spherical antenna disc, fixed at the top is 3 m. The width of the tower at the top has to be 3 m. Select a suitable configuration for the tower and calculate the lateral load for the following data:  Weight of antenna & fixtures : 9 kN  Weight of platform at top : 0.82 kN/m2  Weight of railing at top : 0.30 kN/m2  Weight of ladder and the cage : 0.65 kN/m  Weight of Miscellaneous items: 2.5 kN (such as beacon, lights, lightening cables etc.) Assume relevant data if required. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Write short note on sway and non-sway frames | CO3 | 7 |
|  | b. | Explain lattice tower configurations and bracings with the help of neat sketches. | CO3 | 7 |
|  | c. | Sketch a neat diagram of self-supporting steel stack (chimney) and label its parts. | CO3 | 4 |
|  | d. | Define solidity ratio. | CO3 | 2 |
|  | | **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. | CO 2 | 20 |

ALL THE BEST