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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**Supplementary Examination – June – 2017**

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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. |  | Design a **stiffened seat connection** for ISMB 350 transmitting an end reaction of 315 kN due to factored loads to a column section ISHB 300. The steel is of grade Fe 410 and bolts of grade 4.6. Assume relevant data if required. | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | 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 |
| b. | Neatly sketch the **welded unstiffened seat connection** and label its parts. | CO1 | 3 |
| 3. | a. | An ISMB 350 transmits an end reaction of 450kN under factored loads to the web of ISMB 500 @ 869N/m. **Design the bolted framed connection**, Where the grade of steel is Fe410 and bolts are of grade 4.6. | CO1 | 17 |
|  | b. | List the weld symbols for  i) Single V butt ii) square butt | CO1 | 3 |
| (OR) | | | | |
| 4. | a. | Write the step by step procedure for the design of rafter bracing for Fink type truss roof system. | CO2 | 14 |
|  | b. | Differentiate web buckling and web crippling with neat sketches. | CO2 | 6 |
| 5. | a. | Design a purlin on a sloping roof truss for a clear span of 10m being supported on 300mm thick wall.The spacing of the truss is 4m center to center.The purlins are simply supported on the rafer at a slope of 30o. | CO2 | 17 |
|  | b. | Write short notes on biaxial bending. | CO2 | 3 |
| (OR) | | | | |
| 6. | a. | Briefly explain steel Chimney, types and various components of self supporting chimney with neat sketches. | CO 3 | 10 |
|  | b. | Write the step by step procedure for the design of self supporting Chimney. | CO 3 | 10 |
| 7. | a. | Explain in detail about thecodal provisions for the design of elements in composite structures. | CO3 | 14 |
|  | b. | Briefly explain about shear connectors. | CO3 | 6 |
| (OR) | | | | |
| 8. |  | A 70 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. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Design a simply supported composite beam with 12m span and spaced at 3m. The thickness of the slab is 120 mm. The floor is to carry an imposed load of 3 kN/m2, floor finish load of 0.5 kN/m2and partition load of 1.5kN/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 |

ALL THE BEST