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 – 2017**

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| **Code :** | **14CE3019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DESIGN OF COMPOSITE 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. |  | Explain the elastic behaviour and ultimate theory of composite beams with neat sketches. | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | Discuss the behaviour of composite materials with neat sketches | CO1 | 15 |
| b. | Write the benefits of using composite construction. | CO1 | 5 |
|  |  |  |  |  |
| 3. |  | Design a simply supported composite beam with 5.5m span. The thickness of the slab is 125mm. The floor is to carry a imposed load of 3kN/m2, partition load of 1kN/m2 and floor finish load of 1kN/m2. Take Construction load as 1kN/m2. fck= 30N/mm2. fy= 250N/mm2 | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Differentiate between solid deck slab and profiled deck slab with neat sketche. | CO1 | 6 |
|  | b. | Design a profiled deck slab of 4m span. The thickness of the slab is 100mm. The floor is to carry a imposed load of 2kN/m2, partition load of 1kN/m2 and floor finish load of 1kN/m2. Take Construction load as 1kN/m2. fck= 30N/mm2. Moment of Inertia of the section – 0.8x106 mm4, Plastic Moment of Resistance – 8 kNm, Area of cross section – 1185mm2, Depth of the profile – 75mm | CO2 | 14 |
|  |  |  |  |  |
| 5. |  | A composite floor slab is supported on three span continuous composite beam spaced at 3m centres. The effective length of each span is 4.5m. Thickness of composite slab is 125mm. The floor has to carry an imposed load of 3kN/m2, Partition load 1 kN/m2, Floor finish load 1kN/m2 and Construction load of 1kN/m2. Design the Continuous beam for the given loading. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Draw the various cross section profiles of composite beam and column section? | CO1 | 5 |
|  | b. | Check the plastic resistance of circular composite column having an external diameter of 380mm and height of 4m. Grade of concrete M30, Fe415 steel, Structural steel ISHB 300, Assume the relevant design data | CO2 | 15 |
|  |  |  |  |  |
| 7. |  | Design the fully encased composite column subjected to axial load and uniaxial bending moment for the following data.  Size of column - 400x400mm  Axial load - 450kN  Bending moment - 200kNm  Grade of concrete - M30  Structural steel - ISHB 300 | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | Discuss in detail about the properties of shear connectors with neat sketches. | CO3 | 15 |
|  | b. | What is shear connector? Sketch some of the shear connectors used in practice | CO3 | 5 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Explain steel concrete composite construction of Buildings and Bridges with some case studies. | CO3 | 20 |

ALL THE BEST