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



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

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| **Code :** | **14CE3003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **STRUCTURAL OPTIMIZATION** | **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. | Describe an optimization problem with an example highlighting the design constraint, decision variable and objective function. | CO1 | 12 |
| b. | Explain the term i. basic feasible solution   ii.   slack and artificial variables. | CO1 | 8 |
| (OR) | | | | |
| 2. |  | Using simplex method solve the following linear programming problem  Minimize Z = - 6 x1- 4 x2  2 x1+ 3 x2≤ 30  3x1+ 2x2 ≤ 24  x1 + x2 ≥ 0 | CO2 | 20 |
|  |  |  |  |  |
| 3. |  | Solve by simplex method  Maximize Z = 5x1 – x2  Subject to 2x1+ x2 ≤ 9  x1- 2x2 ≤ 2  -3x1+ 7x2≤ 3  x1, x2 ≥ 0 | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Solve the dual of the following problem using simplex method Minimize Z = 4x1 +3x2 +6 x3  Subject to x1+x3≥2  x2+x3≥5  x1,x2,x3 ≥ 0 | CO2 | 17 |
|  | b. | Write the general form of statement of an optimization problem | CO1 | 3 |
|  |  |  |  |  |
| 5. |  | Minimize the following function  f(x) = x1 x2 x3-2 + 2 x1-1 x2-1 x3 + 5 x2 + 3 x1 x2-2 | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Solve the following LPP by dynamic programming:  Maximize z = 50x1 + 100x2  Subject to 10x1 + 5x2≤ 2500  4x1 + 10 x2 ≤ 2000  x1 + 1.5x2  ≤ 450  x1, x2  ≥ 0 | CO2 | 16 |
|  | b. | State two engineering examples showing dynamic programming problem? | CO1 | 4 |
|  |  |  |  |  |
| 7. | a. | Describe how genetic algorithm derives power during optimization operation? | CO1 | 10 |
|  | b. | Summarize the different types of control parameter in genetic algorithm? | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Compare an artificial neuron model and human brain and explain how it works? | CO1 | 10 |
|  | b. | Illustrate the working of back propagation algorithm using civil engineering problem? | CO2 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Write an account on the ant colony optimization and the steps involved in it? | CO2 | 10 |
|  | b. | Explain the procedure adopted in fuzzy logic to solve engineering problems? | CO1 | 10 |

ALL THE BEST