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"IT'S HARD TO BEAT A PERSON WHO NEVER GIVES UP."

Babe Ruth, American professional baseball player

B.E. (Computer Science & Engineering) Eighth Semester (C.B.S.)
Elective-III : Optimization Techniques

P. Pages : 2

Time : Three Hours

0698

Max. Marks : 80

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Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Diagrams and chemical equations should be given whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) State optimization problem - classify and explain various types of optimization problems with example. **8**

b) Explain intelligent system design with a example. **5**

OR

2. a) Describe an example of optimization algorithm. **7**

b) Enlist and describe various steps in an optimal design formulation process. **6**

3. State the necessary and sufficient condition for single & multivariable optimization problem without using constraints. **13**

OR

4. Describe the advantage and disadvantage of global optimization point in detail. Also explain all the methods of global optimization. **13**

5. a) Explain point - estimation method in detail. **6**

b) Find the cube - root of 10 using cube root finding method. **8**

OR

6. a) Explain the following **8**
    i) Bracketing method.
    ii) Region elimination method.

b) Write note on bisection method in detail. **6**

7. a) Explain Box's evolutionary optimization method. **6**

b) Describe Hooke - Jeeves pattern search method in detail. **7**

OR

8. a) Write short note on Gradient based methods. **13**

       i)   Steepest descent method

       ii)   Newton's method

       iii) Complex search method.

9. a) Explain Kuhn - Tucker conditions of constrained optimization algorithm. **7**

   b) Explain Random search method and complex search method. **6**

<div align="center">**OR**</div>

10. a) Describe transformation method in detail. **6**

   b) Explain Lagrangian duality theorem. **7**

11. a) Explain Duality theory in Linear programming. **7**

   b) Explain Big. M. method in detail. **7**

<div align="center">**OR**</div>

12. a) Describe Frank - Wolfe Linear search method in detail. **6**

   b) Solve the following **8**
Maximize $f(x) = 2x_1 + 3x_2$

Subject to $x_1 \leq 7$

$\qquad 3x_1 + 2x_2 \leq 10$

$\qquad x_1, x_2 \geq 0$

Using Simplex method.

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The secret of getting ahead is getting started.

~ Mark Twain