BRACT'S

Vishwakarma Institute of Information Technology, Pune (21)

M.E (WREE)-SEM III

Subject: Elective I (Optimization Techniques, Solid and Hazardous Waste Management, Project Funding)

Max marks: 50. **Date:**

Note:

Answer Section A, Section B and Section C in separate answer books.
Solve any two full questions from Q.1,Q.2 and Q.3
Solve any four questions from Q.4 to Q.8
Solve any two full questions from Q.9 to Q.12

MAY 2016

SECTION A

Q.1 a) Solve by BIG M method. **5 marks**

Maximize $Z = 8x_1 - 3x_2 + 2x_3$,

Subject to, $2x_1 + x_2 + x_3 \leq 16$,

$3x_1 + 2x_2 + x_3 \leq 18$,

$x_2 - 2x_3 \geq 10$,

$x_1, x_2, x_3 \geq 0$.

b) Solve the problem by simplex method to Maximize **3 marks**

$Z = 6x_1 + 4x_2$,

subject to : $2x_1 + 3x_2 \leq 30$

$2x1 + 3x3 \leq 30$

$x_1 + x_2 \geq 3$

$x_1, x_2 \geq 0$

c) What is Dichotomous search method? Explain it with one suitable example. **2 marks**

Q.2 a) Use Fibonacci method to minimize the function, **4 marks**

$Z = x^3 - 10x$ Within a range of 0 to 5 and an accuracy of 0.1%. Carry out first four iterations only.

b) Use the steepest gradient technique to **3 marks**

Maximize $f(x) = 3x_1 + x_1x_2 - x_1^2 - x_2^2$ Take initial point as (0, 0) and Carry out first two iterations.

c) What is dual problem? When and how it should be solved with primal? **3 marks**

Q.3 a) Solve the problem by Two Phase method **5 marks**

Maximize $Z = 5x - 2y + 3z$,

Subject to, $2x + 2y - z \geq 2$,

$3x - 4y \leq 3$,

$y + 3z \leq 5$

$x, y, z \geq 0$.

b) Maximize $Z = 60x - x^2$ in the interval (0, 80) with an accuracy of 0.1% by using Golden Section method, using n=4. **3 marks**

c) Distinguish between Big M method and Two phase method **2 marks**

SECTION B

Q.4. Explain deep well injection system for liquid hazardous waste disposal with figure. 5 marks

Q.5. Explain in brief land filling method and also explain its advantages and disadvantages 5 marks

Q.6. What are the content of solid waste and write methane gas reaction. 5 marks

Q.7. What is the present scenario of solid waste management in Pune city 5 marks

Q.8 What is 3R principle. How it is application to solid waste management 5 marks

SECTION C

Q.9. Explain the procedures to be followed for grants sanctioning for a project. 5 marks

Q.10. Explain about any one project funding source with suitable example 5 marks

Q.11. Write a note on "Need of clearly identifying objectives for a project" 5 marks

Q.12 Write a note on "Protocols for use of animal and human subjects in research". 5 marks