ASSIGNMENT SET – I

Mathematics: Semester-IV

M.Sc (CBCS)

Department of Mathematics

Mugberia Gangadhar Mahavidyalaya

PAPER - MTM-404A

Paper: Non-linear Optimization

Answer all the questions

1. State and prove Motzkin's theorem of the alternative.
2. What is Nonvacuous matrix? State and prove Fritz John saddle point necessary optimality theorem.

3. What is degree of difficulty?

Minimize $f(x) = \frac{1}{x_1 x_2} + 10x_1 x_2 x_3^{-1} + 20x_2 x_3 + x_1 x_3$, $x_1, x_2, x_3 > 0$

Using geometric programming.

4. Relation between the Solution of MP, LPM, FJSP, KTSP.

State and prove sufficient optimality theorem.

5. Find $X = (x_1, x_2, \ldots x_n)^T$ that minimizes the objective function

$$f(X) = \sum_{j=1}^{N} U_j(X) = \sum_{j=1}^{N} c_j (x_1{}^{a_{1j}} x_2{}^{a_{2j}} \ldots . x_n{}^{a_{nj}}) = \sum_{j=1}^{N} c_j \prod_{i=1}^{n} x_i{}^{a_{ij}}$$

$where\ c_j > 0, x_i > 0$ and a_{ij} are real constant.

6. Write the Primal and Dual Problems for unconstrained Geometic Programming problem.

7. What is expected payoffs? Find the expected payoffs of two players

Strategy	t_1	t_2
s_1	$(4,-4)$	$(-1,-1)$
s_2	$(0,1)$	$(1,0)$

8.State and Prove second existence theorem.

9. What is Chance constrained programming Technique? Write the Beale's algorithm for QPP.

10. what are the basic differences between Polynomial &Posynomial?

11. State and prove Tucker's Lemma.

12. Explain Bimatrix game .

13. State and Prove Separation theorem.

14. what is the advantage of Wolfe's Method?

End