B.N.Bandodkar College of Science, Thane.

T. Y. B. Sc. Preliminary Examination.2012

Operations Research (Applied Component)

Paper I

Duration : 3hours. Max. Marks : 60

N.B. (1) All questions are compulsory.

(2)Use of Calculators is allowed.

Q.1 Attempt any two questions.

a) Define following terms in Linear Programming Problem (LPP) **(6)**

1) Feasible Solution
2) Basic Solution
3) Basic feasible Solution
4) Degenerate basic feasible Solution
5) Optimum Solution
6) Unbounded Solution

b) What is simulation? State the steps to be followed for Monte Carlo Simulation. **(6)**

c) Explain the Net present value appraisal technique. **(6)**

Q.2 Attempt any two questions.

a) Define Dual of Primal Problem. How do you obtain the solution to dual problem from solution of primal problem? **(6)**

b) Give the algorithm of Dual Simplex Method **(6)**

c) Discuss the Sensitivity of the solution if the R.H.S.constant of availability of resource changes. **(6)**

Q.3 Attempt any two questions.

a) Explain Branch and bound method of solving Integer Programming Problem.(IPP) **(6)**

b) Explain Gomorian Method of solving IPP. **(6)**

c) Solve following IPP using Branch and bound method. **(6)**

Maximize $z = X_1 + X_2$

Subject to

$3X_1 + 2X_2 \leq 5$

$X_2 \leq 2$

where X_1, X_2 are nonnegative integers.

Q.4 Attempt any <u>two</u> questions

(a) What are the limitations of simulation technique.? **(6)**

(b) Distinguish between the following i)Right shares and Bonus Shares ii)Face value and the Market value of the share iii)repo and reverse repo rate. **(6)**

(c) i)Give the procedure to generate the observations from an exponential distribution with Mean 2, using the random numbers 65,55,19,28,45,80 **(6)**

ii)Explain the terms 1) Beta value .2)Earning per share as used in securities market.

Q.5 Attempt any <u>two</u> questions

(a) Explain pay back method in an investment analysis. State its merits and demerits . **(6)**

(b) Explain the different types of positions one can take in options market. Also write how the payoffs are characterized in this different types. **(6)**

(c)Define hedge ratio. Derive the expression for the optimum hedge ratio. **(6)**

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