MEL 221 MAJOR TEST NOV 2008

OR PART (must be answered in a separate booklet)

The method used is very important

Q1. Find the mean & variance of

a) The Binomial distribution
b) The Exponential distribution
by first principles.

If X is exponentially distributed with parameter 'mu' what is the expected value & variance of X plus 2a where a is a constant. What is the variance of 2aX? (6)

Q2. max $3x + 2y$
s.t. $2x + y \leq 100$
$x + y \leq 80$
$x \leq 40$
$x, y \geq 0$

a) Solve the above problem by the simplex & the revised simplex methods.

The following parts must be solved using the result obtained in part (a)

b) The profit on y drops from 2 to 1. What is the new solution?

c) One additional constraint is added $y \leq 40$. What is the new solution?

d) The constraint added is $y \geq 40$ instead of $\leq$. What is the new solution?

e) If the right hand side changes from 80 to 90 what would the new solution be. (14)

Q.3 Solve the following transportation Problem:

Shipping Costs, Supply, and Demand for Powerco

	TO				Supply
From	City1	City2	City3	City4	(million kwh)
Plant 1	Rs.08	Rs.06	Rs.10	Rs.09	35
Plant 2	Rs.09	Rs.12	Rs.13	Rs.07	50
Plant 3	Rs.14	Rs.09	Rs.16	Rs.05	40
Demand (million kwh)	45	20	30	30	

(The following part must be solved using the optimal solution already obtained) If the per unit cost of supplying electricity from a) plant 1 to city 1 decreases from Rs. 8 to Rs. 2 what is the new optimal solution ? b) Instead , plant 1 to city 2 increases from Rs. 6 to Rs. 7 what is the new optimal solution? C) If in the original problem the supply from plant 1 & the demand to city 2 were both increased by 2 what would the new solution be? (10)