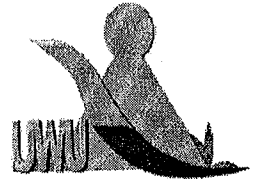


Uva Wellassa University, Sri Lanka.
End Semester Examination - August / September 2011
IIT 361-2 Operational Research



Time: Two (2) hours

Answer all (03) questions.

Calculators are allowed.

Total two (02) pages.

01. a.) State limitation of solving LP problems by using the Graphical Method. (3 marks)
- b.) Ceylon Petroleum Cooperation blended two types of oil, heavy and light, to make its special all-purpose oil. Each gallon of heavy oil has a sulfur content of 3%, while each gallon of light oil has a sulfur content of 1%. The company needs at least 10,000 gallons of the all-purpose oil, which must have a sulfur content at least 1.5%, but not more than 2%. Heavy oil costs Rs 0.60 per gallon, and light-oil costs Rs 0.75 per gallon. How many gallons of each oil, heavy and light, must the Petroleum blend in order to minimize its cost? Use the Graphical Method to solve the problem. (27 marks)
02. a.) General Simplex Method, big M method and Two-Phase Simplex Method are three Simplex Methods in Linear Programming (LP), State the advantage of each over the others. (3 marks)
- b.) Casio Computer Co. Ltd makes both regular and deluxe model battery. Each battery has 1 plastic casing. The regular model can be assembled in 10 minutes, while deluxe model takes 15 minutes. The firm must produce at least 120 regular and 150 deluxe batteries. It has 300 plastic cases on hand and 8 employees in the assemble department, each of whom works an 8 hour-day. Find possible combinations of batteries in a day by using the Simplex Method. (32 marks)

03. a.) North-West Corner Method, Minimum Cost Method and Vogel's Method can be used for the first phase of the Transportation Problems. State the advantage of each over the others.

(3 marks)

- b.) Elcardo Industries Colombo Ltd. manufactures three types of steel at different plants. The time required manufacturing one ton of steel (regardless of type) and the costs at each plant are shown in the following table. Each week, 100 tons of each type of steel must be produced and each plant open 40 hours per week. Formulate balanced transportation problem to minimize the cost of meeting Elcardo's weekly requirement and then solve the problem by using Transportation Method.

plant	Cost(Rs)			Time (minutes)
	Steel 1	Steel 2	Steel 3	
Biyagama	60	40	28	20
Kadawatha	50	30	30	16
Maharagama	43	20	20	15

(32 marks)