IV Sem M.Sc(SS) – Operations Research – Assignment 1- 07.01.21

Write in notebook and submit the scanned copy through Nucleus on or before 12.01.21.

Model the following LPP and solve the same by Graphical Method.

1.A public relations director for a homeopathic is seeking to advertise her company's products on two different websites—one is a medical parts supplier and the other is a fitness e-zine (a web-based magazine). The medical parts supplier website receives, on average, about 1,200,000 hits per day per page, while the fitness e-zine receives about 2,000,000 hits per day per page. The daily cost to advertise is $1,100 per advertisement and $1,600 per advertisement, respectively. The director would like at least 15 ads and is able to allocate up to $50,000 for advertising. At least 3 ads should be placed on each website. How many adds should be placed on each website to maximize the potential number of readers (even if some viewers see the add on different pages of the website)?

2. A local school governing board approves a new math education program that is to be implemented at a series of elementary schools within the district. Money for the program will come from two different budgets: public expenditures budget and grade-school initiatives budget. The board is willing to pay at least half of what comes out of the initiatives budget from its public expenditures budget. Since this program is considered an initiative, the government mandates that at least $2,000 comes from the local initiatives budget. Both budgets are partially funded by federal emergency funding. For the public expenditures budget, the percentage is 55% and 23% for the grade-school initiatives budget. In order to properly use emergency funding, the district would like to minimize the use of federal dollars. How much should come from each budget?

3..A human resources office is working to implement an increase in starting salaries for new administrative secretaries and faculty at a community college. An administrative secretary starts at $28,000 and new faculty receive $40,000. The college would like to determine the percentage increase to allocate to each group, given that the college will be hiring 8 secretaries and 7 faculty in the upcoming academic year. The college has at most $5,000 to put towards raises. What should the percentage increase be for each group?

4. A health-food business would like to create a high-potassium blend of dried fruit in the form of a box of 10 fruit bars. It decides to use dried apricots, which have 407 mg of potassium per serving, and dried dates, which have 271 mg of potassium per serving
The company can purchase its fruit through www.driedfruitbaskets.com in bulk for a reasonable price. Dried apricots cost $9.99/lb. (about 3 servings) and dried dates cost $7.99/lb. (about 4 servings). The company would like the box of bars to have at least the recommended daily potassium intake of about 4700 mg, but would like to keep it under twice the recommended daily intake. In order to minimize cost, how many servings of each dried fruit should go into the box of bars?

5. An airline offers coach and first-class tickets. For the airline to be profitable, it must sell a minimum of 25 first-class tickets and a minimum of 40 coach tickets. The company makes a profit of $225 for each coach ticket and $200 for each first-class ticket. At most, the plane has a capacity of 150 travelers. How many of each ticket should be sold in order to maximize profits?