**Question 1**

Raja Toys Mfg Ltd manufactures wooden soldiers and trains. Each soldier sells for Rs. 27, uses Rs. 10 of raw materials and takes Rs. 14 of labor & overhead costs. Each train sells for Rs. 21, uses Rs. 9 of raw materials, and takes Rs. 10 of overhead costs. Each soldier needs 2 hours finishing and 1 hour carpentry; each train needs 1 hour finishing and 1 hour carpentry. Raw materials are unlimited, but only 100 hours of finishing and 80 hours of carpentry are available each week. Demand for trains is unlimited; but at the most 40 soldiers can be sold each week. How many of each toy should be made each week to maximize profits? Formulate this as an LPP.

**Question 2**

ABC Manufacturing Company tape recorder company manufactures Products A, B and C, which have profit contributions per unit of Rs 15, Rs. 40 and Rs. 60, respectively. The weekly minimum production requirements are 25 units for Product A, 130 units for Product B and 55 units for Product C. Each type of recorder requires a certain amount of time for the manufacturing of the component parts, for assembling and for packing. Specifically, a dozen units of Product A require 4 hours for manufacturing, 3 hours for assembling and 1 hour for packaging. The corresponding figures for a dozen units of Product B are 2.5, 4 and 2 and for a dozen units of Product C are 6, 9 and 4. During the forthcoming week, the company has available 130 hours of manufacturing, 170 hours of assembling and 52 hours of packaging time. Formulate this problem as an LP model so as to maximize the total profit to the company.

**Question 3**  
A company produces 3 products X, Y and Z. The production department produces each day, components sufficient to make 50 units of X, 25 units of Y and 30 units of Z. the management is confronted with the problem of optimizing the daily production of the products in the assembly department, where only 100 man-hours are available daily for assembling the products. The following additional information is available: Type of Product X Y Z Profit Contribution per unit of Product (Rs) 12 20 45 Assembly Time per Product (hrs) 0.8 1.7 2.5 The company has a daily order commitment for 20 units of product X and a total of 15 units of Y and Z. Formulate this problem as an LP model so as to maximize the total profit.