

- At least 90% of the available funds should be distributed among the above loan types
- Personal loans cannot exceed 30% of the total amount lent and none of the other loans can exceed 50% of the total amount lent
- Educational loans and home loans must each be at least 20% of total loans
- Home loans and auto loans taken together cannot exceed 40% of the total loans

Formulate as a linear programming model to maximize the total interest return for the bank. **Do not solve.**

Q. 7 b The following table gives the maintenance costs and resale prices of a certain equipment whose purchase price is Rs. 5000.

| Year                   | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
|------------------------|------|------|------|------|------|------|------|------|
| Maintenance cost (Rs.) | 1500 | 1600 | 1800 | 2100 | 2500 | 2900 | 3400 | 4000 |
| Resale value (Rs.)     | 3500 | 2500 | 1700 | 1200 | 800  | 500  | 300  | 200  |

What is the optimal replacement period, considering the time value of money as 10% p.a?

Extract from table of Present Values of Re. 1:

| Year      | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| PV Factor | 0.909 | 0.826 | 0.751 | 0.683 | 0.621 | 0.564 | 0.513 | 0.467 | 0.424 | 0.386 |