Practical Manual

Agricultural Finance and Cooperation

Course Code AEC 226 Credit Hours 3(2+1)
(For Undergraduate Agricultural students)

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Syllabus: Determination of most profitable level of capital use. Optimum allocation of limited amount of capital among different enterprise. Analysis of progress and performance of cooperatives using published data. Analysis of progress and performance of commercial banks and RRBs using published data. Visit to a commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures. Estimation of credit requirement of farm business - A case study. Preparation and analysis of balance sheet - A case study. Preparation and analysis of income statement - A case study. Appraisal of a loan proposal - A case study. Technoeconomic parameters for preparation of projects. Preparation of Bankable projects for various agricultural products and its value added products. Seminar on selected topics.

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Objective: Determination of the most profitable level of capital use

Factor product relationship is essential in farm management because it helps to answer the question like what level of output (How much to produce) to be produced in a farm *i.e.*, in each crop or livestock enterprise on a farm? It would help us in finding not only the optimum level of output but also the optimum level of the variable inputs. A factor product relationship is considered as one of the basic relationships in production economics.

Exercise.1: From the data given below find out

- (i) TC, AFC, AVC, ATC, MC if the price of input = RS 20/kg & TFC = Rs 4000.
- (ii) Workout the profit if the price of output Rs.8/kg.

| Input (x) Qty | Fixed Cost in Rs | Output (y) |
|---------------|------------------|------------|
| 0 | 4000 | 0 |
| 20 | 4000 | 500 |
| 40 | 4000 | 1100 |
| 60 | 4000 | 1750 |
| 80 | 4000 | 2250 |
| 100 | 4000 | 2550 |
| 120 | 4000 | 2700 |
| 140 | 4000 | 2750 |
| 160 | 4000 | 2750 |
| 180 | 4000 | 2700 |
| 200 | 4000 | 2600 |

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Exercise No. 2: For the given product and cost relationship, work out the Average physical product, Marginal physical product, Total variable cost, Average variable cost, Average fixed cost, Total cost, Average total cost and marginal cost and determine the most profitable yield of jatropha for the following data, when the cost of N is Rs.10/kg and the price of Jatropha is Rs.40 per unit

| Input (X ₁) N in kgs | Output (Y) in Kgs (TPP) | TFC |
|----------------------------------|-------------------------|------|
| 0 | 0 | 5000 |
| 20 | 50 | 5000 |
| 40 | 110 | 5000 |
| 60 | 175 | 5000 |
| 80 | 225 | 5000 |
| 100 | 255 | 5000 |
| 120 | 270 | 5000 |
| 140 | 275 | 5000 |
| 160 | 275 | 5000 |
| 180 | 260 | 5000 |
| 200 | 250 | 5000 |

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Objective: Optimum allocation of limited amount of capital among different enterprises

Exercise 1: Estimate the optimal financial input level for the following data wherein the unit price of groundnut is Rs. 25 and each financial input is worth Rs. 8.20.

| G | | | | | | | | |
|--|---------|------------|----------|------------|-------------|----------|--------|--------|
| Level of financial input (Rs.) (X) Groundnut yield (kg) (Y) | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| Groundnut yield (kg) (Y) | 140.71 | 141.72 | 144.4 | 145.49 | 147.10 | 147.23 | 147.53 | 147.61 |
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| Exercise 2: Graphically explain | optimal | enterprise | e combin | ation (use | e data in e | exercise | 1.). | |
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Exercise 3: Suppose Mr. Pankaj, a farmer based at Jhansi district, has Rs.25 lakh to invest in the green house to realize a product combination of tomato (Y1) and capsicum (Y2). Suggest him a suitable product combination with the following yield levels given the price of tomato (py1) being Rs.14.75 per kg and price of capsicum (Py2) being Rs. 60.50 per kg.

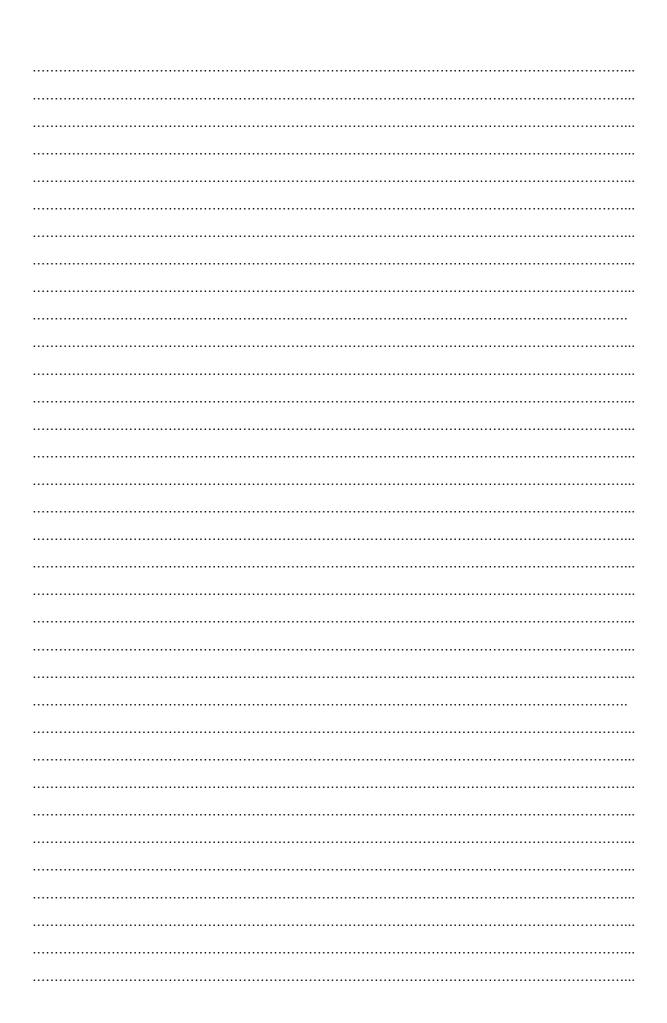
| Tomato yield (Y1) in Qtl | 25 | 50 | 75 | 100 | 125 | 150 | 175 |
|--|----|----|----|-----|-----|-----|-----|
| Tomato yield (Y1) in Qtl Capsicum yield (Y2) in Qtl | 72 | 68 | 62 | 53 | 42 | 28 | 10 |
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Exercise 4: Apply equi-marginal returns principle to optimally allocate the capital resource.

| Amount of capital used in Rs. | | Added Returns in Rs | | | | | |
|-------------------------------|-------|---------------------|-------|---------|--|--|--|
| | | Crop | Dairy | Poultry | | | |
| First | 10000 | 20000 | 19000 | 21000 | | | |
| Second | 10000 | 19000 | 18000 | 19000 | | | |
| Third | 10000 | 15000 | 15000 | 15000 | | | |
| Fourth | 10000 | 12000 | 11000 | 12000 | | | |
| Fifth | 10000 | 10000 | 9000 | 11000 | | | |
| Total returns from Rs. | 50000 | 76000 | 72000 | 78000 | | | |
| Net profit Rs. | | 26000 | 22000 | 28000 | | | |

Expenditure according to principle of equi-marginal return

| Year | Amount | Enterprise | Marginal Return |
|------------|--------|------------|-----------------|
| First | 10000 | | |
| Second | 10000 | | |
| Third | 10000 | | |
| Fourth | 10000 | | |
| Fifth | 10000 | | |
| Total | 50,000 | | |
| Net Profit | | | |



Objective: Analysis of progress and performance of cooperatives using published data

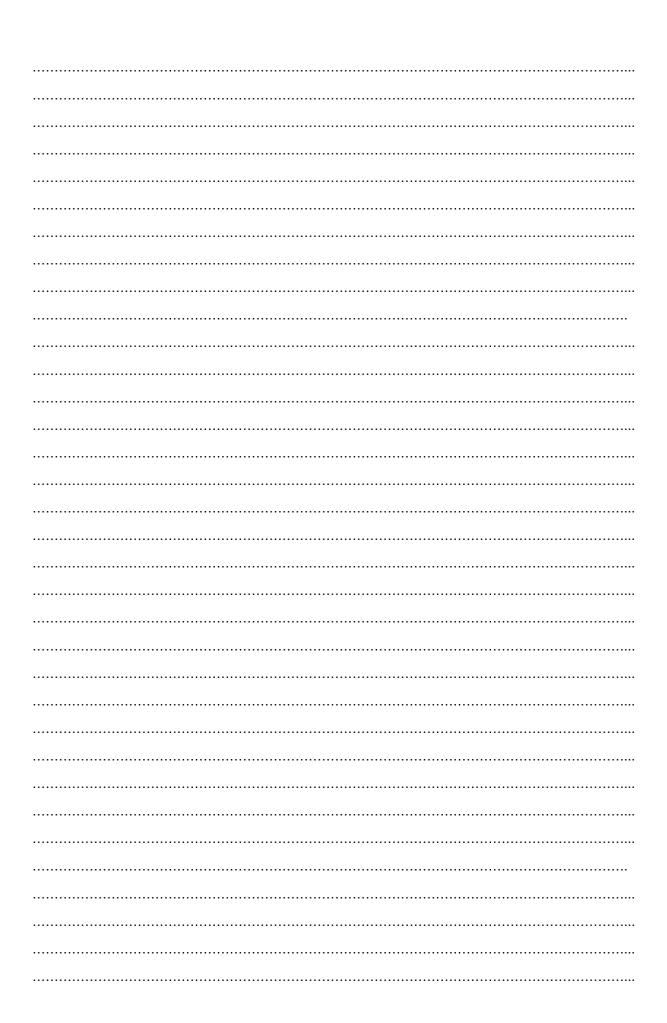
Introduction: The adoption of capital-intensive modern technologies has commercialized the agricultural landscape in India. As finance plays a major role in the operationalization of agricultural itself, the performance of a financial institution needs to be analyzed. CAMEL model is basically an approach widely used to measure the performance of a banking unit. CAMEL is an abbreviation stands for Capital adequacy, Assets quality, Management efficiency, Earning quality and Liquidity. It is a supervisory rating system originally developed in the USA to classify a bank's overall condition.

Progress and Performance of Cooperative Banks in India

Exercise 1. Work out CAMEL indicators for Cooperative banks

| Year | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Number of societies | 46222 | 89523 | 90279 | 101297 | 90958 | 93042 | 92789 | 93367 | 95595 | 95238 |
| Total Members | 56821 | 122226 | 106136 | 127646 | 110068 | 130120 | 121088 | 127322 | 131235 | 130547 |
| Total no of Borrowers (in 000) | 27317 | 57802 | 47714 | 52374 | 42629 | 48081 | 49858 | 46214 | 52017 | 50690 |
| Paid up capital (crores) | 2786 | 6828 | 7005 | 9467 | 8008 | 9789 | 11068 | 12281 | 14122 | 14142 |
| Total Reserves (crores) | 2252 | 5350 | 6417 | 8565 | 6668 | 9135 | 10607 | 12162 | 18860 | 16800 |
| Total Deposits (crores) | 13375 | 35680 | 37282 | 54763 | 37561 | 81895 | 84616 | 101065 | 115884 | 119632 |
| Total Borrowings (crores) | 21375 | 49074 | 48226 | 97564 | 81385 | 95836 | 99980 | 112690 | 124831 | 128333 |
| Total Working Capital (crores) | 41466 | 130314 | 109385 | 173564 | 148939 | 212429 | 223711 | 201304 | 239967 | 243563 |
| Total Loans Issued (crores) | 27465 | 72882 | 85296 | 122826 | 98440 | 171420 | 159050 | 180824 | 200678 | 207322 |
| Total Loans Outstanding | 28515 | 80487 | 79504 | 103462 | 91171 | 130054 | 147226 | 158487 | 170459 | 169630 |
| (crores) | | | | | | | | | | |
| Total Demand (crores) | 31978 | 92557 | 85757 | 101782 | 95926 | 155853 | 159626 | 169783 | 200464 | 196750 |
| Total Collection (crores) | 22760 | 54271 | 64490 | 76705 | 70346 | 126221 | 123835 | 139894 | 147171 | 148834 |
| Overdue | 9219 | 38282 | 21428 | 25234 | 25580 | 29632 | 35791 | 29889 | 53293 | 47915 |
| Average member per society | | | | | | | | | | |
| Proportion of Borrowing | | | | | | | | | | |
| Members | | | | | | | | | | |

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Objective: Analysis of progress and performance of Commercial Banks and RRB's using published data

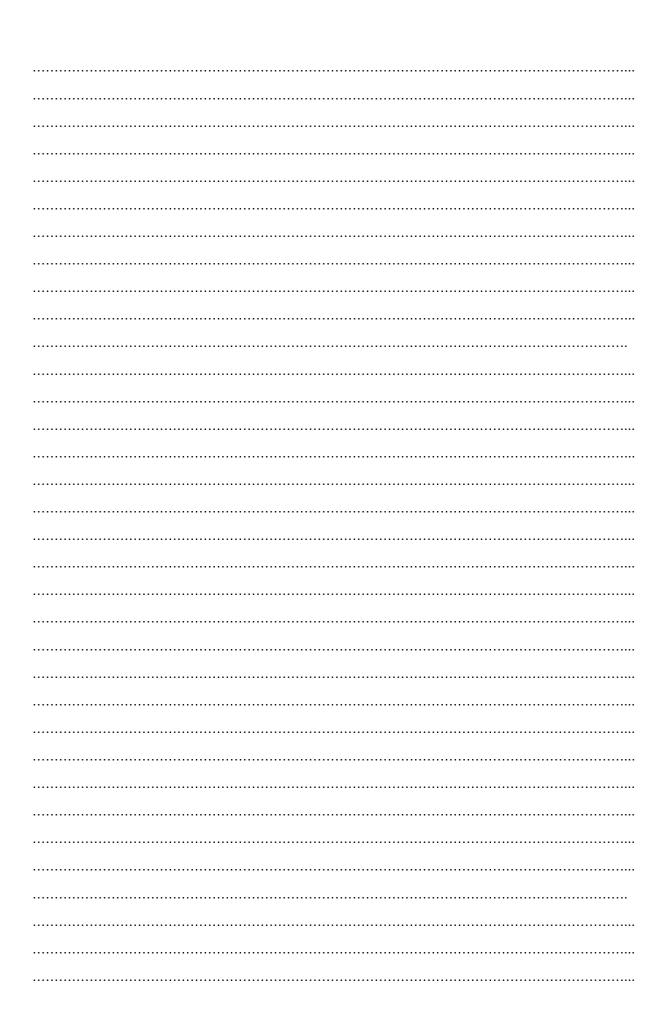
Exercise 1. The following is the hypothetical financial data of the Commercial Cooperative Bank Limited based at INDIA. Work out CAMEL indicators

| Total Debits: Rs. 3,05,10,193 | Total Advances: Rs. 5,27,42,128 | Net Advances: Rs. 2,84,750 |
|------------------------------------|---------------------------------------|---|
| Total Equity: Rs. 1,05,10,193 | Risk Weighted Assets: Rs. 7,27,68,052 | Total Investment: Rs. 87,49,125 |
| Net NPA's: Rs. 87,32,114 | Total Assets: Rs. 8,12,22,625 | Total Deposits: Rs. 2,13,85,926 |
| Total Employees: 65 | Gross Returns: Rs. 92,43,129 | Tax Rate: 30 % |
| Average Assets: Rs. 7,67,88,910 | Net Interest Income: Rs. 29,34,128 | Average earning Assets: Rs. 5,21,05,129 |
| Net Capital Funds: Rs. 2,50,87,465 | Cash Assets: Rs. 1,76,18,423 | Government Securities: Rs. 32,12,221 |

Financial Indicators of Commercial Banks in India

| Year | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| No. of Banks | 149 | 148 | 147 | 147 | 146 | 155 | 173 | 167 | 167 | 170 | 173 | 182 | 222 | 288 |
| Deposits | 25846168 | 111114481 | 100926513 | 94338380 | 85331730 | 74296772 | 64535485 | 56158743 | 47469196 | 40632011 | 33200616 | 26969365 | 21646817 | 18375594 |
| Advances | 87459775 | 81161090 | 78964670 | 73881600 | 67352132 | 58797733 | 50735592 | 42974875 | 34967200 | 29999239 | 24769360 | 19812363 | 15168114 | 11508363 |
| Branches | 42336 | 48482 | 54628 | 60774 | 67562 | 72906 | 78215 | 85262 | 92114 | 97649 | 103795 | 109942 | 116088 | 122233 |
| Capital | | | | | | | | | | | | | | |
| Investment | 295893 | 83044 | 47037 | -35559 | 63170 | -17136 | 38305 | 33443 | -13627 | 46148 | 20770 | 47832 | 107956 | 112489 |
| total assets | 152532925 | 141746065 | 131292882 | 120369921 | 109759285 | 95899521 | 83208903 | 71833978 | 60269252 | 52386422 | 43261660 | 34599618 | 27858633 | 23555093 |
| Total liabilities | 152532925 | 141746065 | 131292882 | 120369921 | 109759285 | 95899521 | 83208903 | 71833978 | 60269252 | 52386422 | 43261660 | 34599618 | 27858633 | 23555093 |
| Net profit | -324377 | 438995 | 341482 | 890778 | 809127 | 911647 | 816583 | 703313 | 571092 | 527499 | 427259 | 312026 | 245818 | 209582 |
| NPA | 3206163 | 2051618 | 1766589 | 804827 | 666446 | 495857 | 405506 | 315788 | 306806 | 207347 | 133958 | 80821 | 53551 | 58762 |
| Cash Deposit Ratio | 6.19 | 6.12 | 5.59 | 5.60 | 5.53 | 5.05 | 5.79 | 8.17 | 7.71 | 7.32 | 9.73 | 7.24 | 6.67 | 6.43 |
| Credit Deposit Ratio | 74.16 | 73.04 | 78.24 | 78.32 | 78.93 | 79.14 | 78.62 | 76.52 | 73.66 | 73.83 | 74.61 | 73.46 | 70.07 | 62.63 |
| Investment - Deposit Ratio | 34.99 | 32.87 | 32.97 | 31.56 | 33.79 | 35.17 | 34.62 | 34.25 | 36.42 | 35.68 | 35.46 | 35.26 | 40.03 | 47.33 |
| No. of Workers | 1335702 | 1300008 | 1256085 | 1180069 | 1150281 | 1096980 | 1048520 | 970782 | 950178 | 937445 | 907337 | 896343 | 876955 | 858560 |

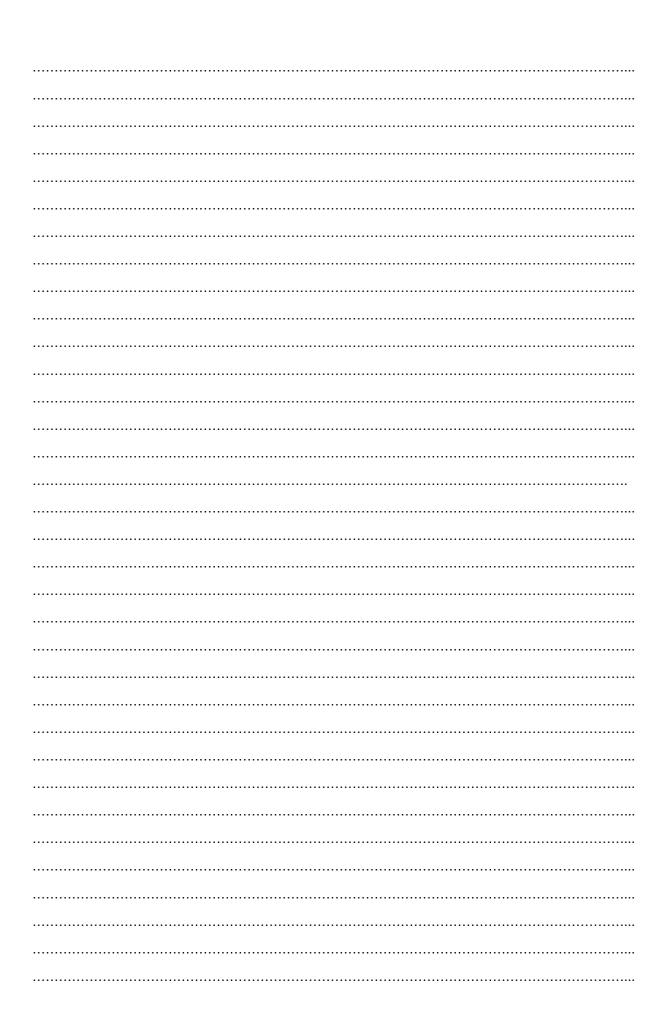
| Exercise 2: Work out CAMEL indicators for commercial banks |
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Exercise No. 5

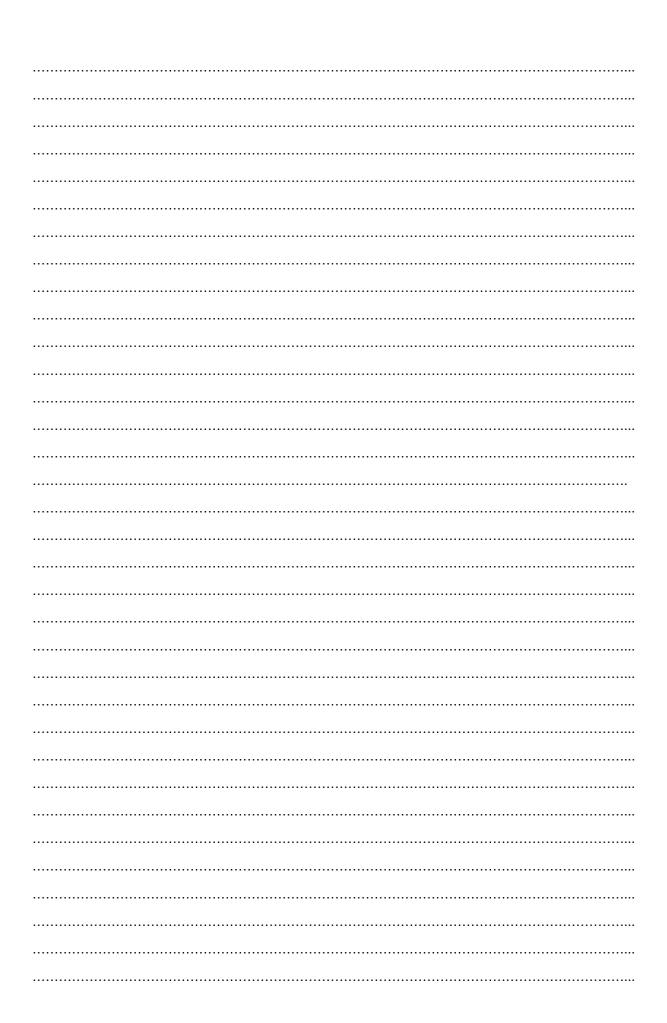
Objective: Visit to a Commercial Bank, Cooperative Bank/ Cooperative society to acquire first- hand knowledge of their management, schemes and procedures

| C | : Visit to PACB and collect details on administrative set up / management, members capital, sources of fund, area of operation, loans and other facilities provided to far others etc. | |
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Objective: Visit to a District Central Co-operative Bank (DCCB) to study its role, functions and procedures for availing loan- Fixation of Scale of Finance

| Exercise: | Visit to DCCB and collect details on cooperative banking set up / management, membership, share capital, sources of fund, area of operation, loans fixation of scale of finance and other facilities provided to farmers and others etc. |
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Objective: Estimation of Credit Requirement of Farm Business – A Case Study

Estimate the credit requirement of a groundnut farmer per ha using cost of cultivation approach

| S. | Item | Physical unit | Value (Rs.) | Working |
|-----|--|------------------------------|-------------------|---------|
| No. | | - | | capital |
| 1. | Farm Buildings (Rs.) | 1 | 1.75 lakh | - |
| 2. | Tractor (Rs.) | 1 | 15 lakh | - |
| 3. | Land vlue (Rs. / ha) | 1 | 22 lakh | - |
| 4. | Depreciation rate of tractor @ 12.50% | 10% x 15 lakh | = 15 lakh x | 150,000 |
| 5. | Depreciation rate of farm buildings | 7.5% | =1.75 lakh x 7.5% | 13,125 |
| 6. | Seed | 100 kg @ Rs.65/ kg | 6500 | 6500 |
| 7. | Fertilizer | 200 kg @ Rs.72/ kg | 14,400 | 14,400 |
| 8. | Manures–purchased (Rs./ha) | 5 tonnes @ Rs.4000 per tonne | 20,000 | 20,000 |
| 9. | Plant protection chemicals (Rs./ha) | 4 litres @ Rs.800 per litre | 3200 | 3200 |
| 10. | Human labour (Rs./ha) | Rs.300/-day for 43 man-days | 12,900 | 12,900 |
| 11. | Animal labour (Rs./ha) | 4 bullock pair @ 1200 / pair | 4800 | 4800 |
| 12. | Working capital | 224,925 | | |
| 13. | Interest on working capital (7%) | 15,745 | | |
| 14. | Total working capital (Cost A) | 240,760 | | |
| 15. | Depreciation amount | | | 163,125 |
| 16. | Credit requirement = Cost A – Deprecia | ation | | 77,545 |

In this example, the credit requirement of a groundnut farmer comes out to be Rs.77,545 for per ha.

Proportionate cost approach: The credit requirement of a farmer can also be determined by the proportion of credit requirement of an ith farmer for jth crop (Pij). As the proportion of credit requirement (Pi) varies upon the farm size (Aij), the specification will be,

Credit requirement = Cost A X Pij X Aij

| Type of farmer | Proportion (P _{ij}) | Cost A (Rs.) | Area (A _{ij}) | Credit Requirement estimation = Cost A x P _{ij} x A _{ij} | Credit Required (Rs.) |
|----------------|-------------------------------|--------------|-------------------------|---|-----------------------|
| Small | 55% | 240,760 | 1 | = 240,760*0.55*1 | 132418 |
| Medium | 45% | 240,760 | 3 | = 240,760*0.45*3 | 325026 |
| Large | 35% | 240,760 | 5 | = 240,760*0.35*5 | 421330 |

Exercise 1: Estimate the credit requirement of a 1 ha groundnut farmer with the given data using (i) Gross value approach. (ii) Cost of cultivation approach, and (iii) proportionate cost approach. Specify appropriate formula as required.

| SI. No. | ltem | Rs./ha |
|---------|-------------------------------------|------------------------------|
| 1. | Farm Buildings (Rs.) | 1.75 lakh |
| 2. | Tractor (Rs.) | 12.5 lakh |
| 3. | Land value (Rs./ha) | 22 lakh |
| 4. | Depreciation rate of tractor | 12.50% |
| 5. | Depreciation rate of farm buildings | 7.5% |
| 6. | Seed (Rs./ha) | 6500 |
| 7. | Fertilizer (Rs./ha) | 7200 |
| 8. | Manures – purchase (Rs./ha) | 1250 / quintals for 5 tonnes |
| 9. | Plant protection chemicals (Rs./ha) | 6800 |
| 10. | Human labour (Rs./ha) | Rs.300/- day for 43 man days |
| 11. | Animal labour (Rs./ha) | 4 bullock pair @ 1200/- pair |

| Machine labour (Rs./ha) | 12 hours @ 750/- hour |
|---|---|
| Irrigation charges (Rs.) | Rs.300/- day for 6 man days |
| Rent paid for leased – in land (Rs./ha) | 10% of the value of main product |
| Rental value of owned land (Rs./ha) | 15% of value of main product |
| Family labour (Rs./ha) | 32 man days |
| Electricity charges (Rs./ha) | 2500 |
| Land revenue (Rs. / ha) | 60 |
| Manures – owned (Rs. / ha) | 3 tonnes |
| Interest on tractor's value (Rs./ha) | 14.5% |
| Interest on working capital (Rs./ha) | 7% |
| Price of main-product (Rs./ha) | Rs.1250 for 20 kg |
| Price of by-product (Rs./ha) | Rs.16 per kg |
| Yield of main-product (Qtl/.ha) | 18.25 qtl |
| Yield of by-product (qtl/.ha) | 450 kg |
| | Irrigation charges (Rs.) Rent paid for leased – in land (Rs./ha) Rental value of owned land (Rs./ha) Family labour (Rs./ha) Electricity charges (Rs./ha) Land revenue (Rs. / ha) Manures – owned (Rs. / ha) Interest on tractor's value (Rs./ha) Interest on working capital (Rs./ha) Price of main-product (Rs./ha) Price of by-product (Rs./ha) Yield of main-product (Qtl/.ha) |

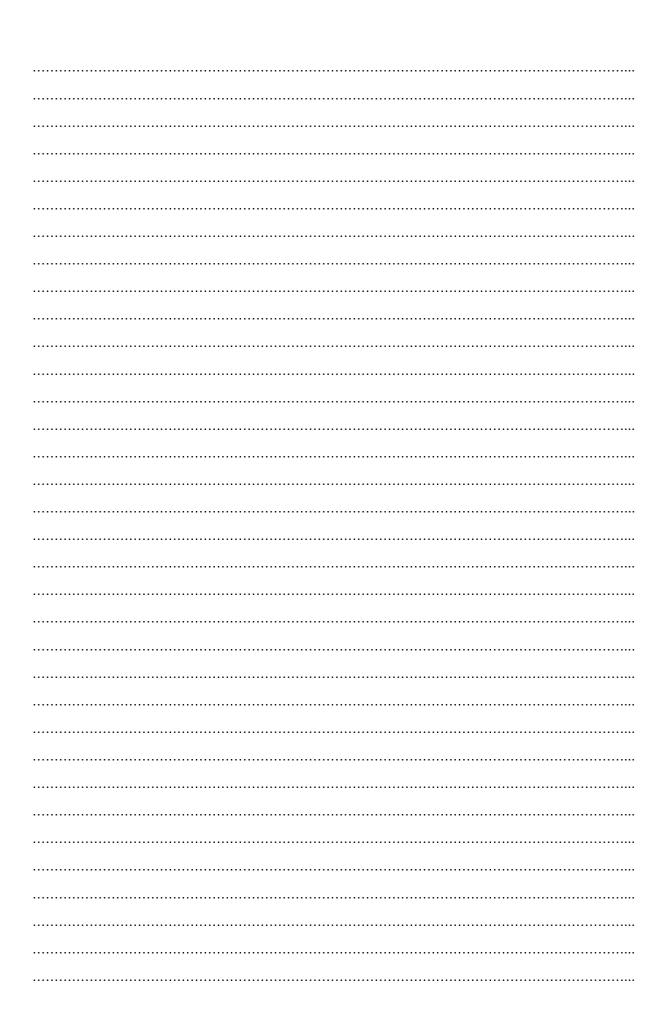
| Average: Acreage for small farmer is 1 ha; 2 ha medium farmer; and 5 ha large farmer. |
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Objective: Preparation and analysis of balance sheet and cash flow statement- A Case Study

A model balance sheet or net-worth statement

| | | mount Liabiliti | |
|--|----------|---|----------|
| | (in Rs.) | | (in Rs.) |
| Current assets | | Current Liabilities | |
| Cash on hand | 10,000 | Crop loans to be repaid to institutional agencies | 8,000 |
| Savings in Bank | 8,000 | Accounts payable | 11,000 |
| Value of grains ready for disposal | | Hand loans | 5,000 |
| Livestock products (eggs, birds etc.) | | Money owed to input suppliers | 25,000 |
| Fruits vegetables fodder, and feed ready for sale | 8,000 | Annual installments of MT and LT loans | 19,000 |
| Value of bonds and shares to be realized in the same year. | 2,000 | | |
| Sub-Total | 1,26,500 | Sub-Total | 68,000 |
| | | | |
| Intermediate assets | | Intermediate Liabilities | • |
| Dairy cattle | 10,000 | Livestock loan (outstanding amount) | 8,000 |
| Bullocks | | Machinery loan (outstanding amount) | 15,000 |
| Poultry birds | 15,000 | Unsecured loan (outstanding amount) | 10,000 |
| Machinery and equipment | 15,000 | | |
| Tractor | 1,75,000 | | |
| Sub-Total | 2,24,000 | Sub-Total | 33,000 |
| Long term assets | | Long-term liabilities | |
| Land | 6,00,000 | Tractor loan (outstanding amount) | 1,20,000 |
| Farm Buildings | 25,000 | Orchard loan (Outstanding amount) | 25,000 |
| | | Unsecured loans (land development) | 10,000 |
| Sub-total | 6,25,000 | Sub-total Sub-total | 1,55,000 |
| Total of assets | 9,75,500 | Total of liabilities Net worth or equity | 2,56,000 |
| | | Total of liabilities + | 7,19,500 |
| | | Net worth | 9,75,500 |

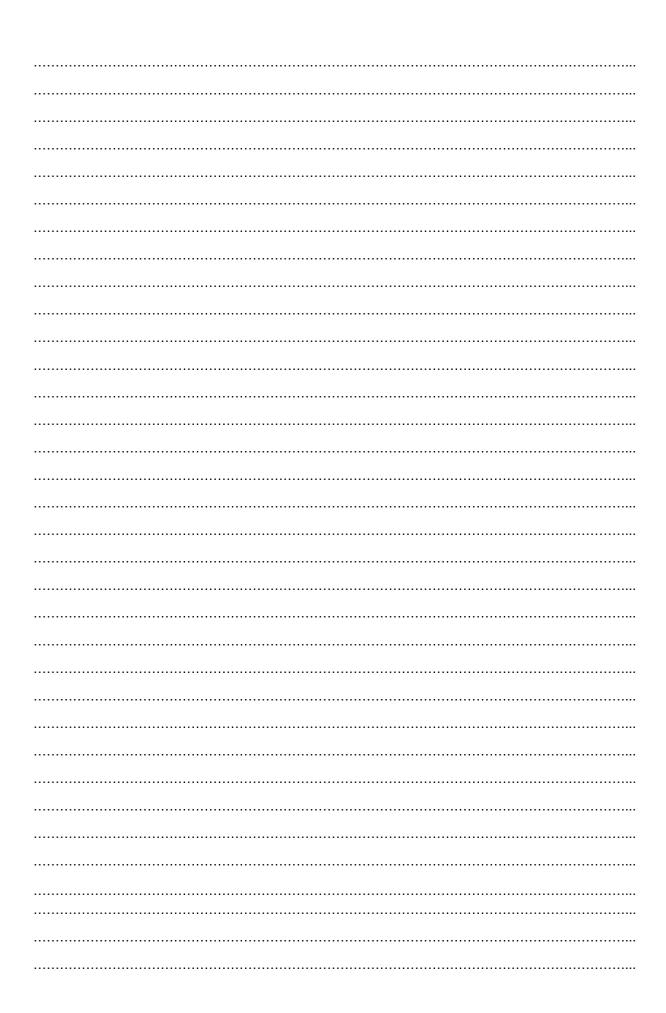
| Estimation of Test ratios: | |
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Exercise 1: Prepare a balance sheet as on 31.03.2018 of a farm using the following information and test the liquidity and solvency status of the farm. Balance of sheep loan Rs. 7,000, bank balance Rs. 30,000, Cash on hand Rs. 300, Value of milch animal Rs. 5,000, Amount receivables Rs.800, Intercrop Black gram for sale Rs. 5,000, Bullock pairs Rs. 6,000, Crops & Supplies in store Rs. 3,000, wet land (1/2 ac) Rs. 15,000, Oil engine Rs. 7,000, Value of Bullock cart Rs. 4,000, Dry land 5 Ac Rs. 80,000, Garden land 3 Ac Rs. 60,000, Mango garden Rs. 25,000, Operating loan payment Rs. 10,000, Forthcoming principal due on long term loan Rs. 3,000 and Mortgage of land Rs. 25,000.

Exercise 2: Classify the assets and liabilities as on 31.10.2019 in the given problem and prepare a balance sheet. Comment on the net worth of the business.

| The Farmer has 13.50 acres of land of which, 10 acres are dry land that has a market value of Rs. 8 000/ac, 3 acres are garden land whose value is Rs. 40, 000 and 0.50 acres of wetland worth Rs. 40,000. He has mortgaged land worth of Rs. 40,000 with the Land Development Bank. He has established a mango garden in 1.00 acre ten years back. It is worth Rs. 20,000. He has standing crops and other inputs stored to the value of Rs. 30,000. He has in his store, cotton worth of Rs. 5,000 means for sale. The farmer has a bullock cart valued at Rs. 7,000 and a pair of bullocks worth Rs. 10,000. He has purchased the bullocks on loan and the balance to be paid is Rs. 7,000. He has a milch animal for home consumption worth of Rs. 4,500. The Farm has an oil engine worth of Rs. 7,000. The farmer has to repay (principle and interest) Rs. 15,000 on the crop loan and Rs. 4,000 in long term loan. He has a bank balance of Rs. 2,500, cash Rs. 1,500 and accounts receivable of Rs. 1,500. |
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Exercise: 3: From the given table, work out the total cash income, total cash expenses, net cash farm income, total capital sales, net capital flow, total other income, total other expenditure, net other income less expenditure, net cash farm income, net capital expenditure, net income, net other income, cash surplus and closing bank balance for all the four quarter's and for the whole year.

Quarterly Cash flow summary for the period from July, 2019 – June 31, 2020

| SI. No. | Particulars Section 1: Ne | Uquarter July'16- Sep'16 | Oct'16 - Dec'16 | III Quarter Jan2017- Mar2017 | IV Quarter Apr2017- Jun2017 | Yearly Total July 2016 - June 2017 | | |
|-----------------|---|--------------------------|--------------------|---------------------------------------|---|---|--|--|
| Α. | Cash Income | Lasii ia | | lie | | | | |
| <u>7.</u> 1. | Crops | | | | | | | |
| | Paddy | 7,500 | | 10,500 | | | | |
| | Groundnut | 6,000 | 6,000 | | | | | |
| | Sugarcane | 2,500 | 3,000 | 20,000 | | | | |
| 2. | Broiler sales | 5,000 | 5,500 | | | | | |
| 3. | Milk sales | 1,150 | 400 | 1,250 | 1,000 | | | |
| 4. | Total cash income | 1,100 | | ,, | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | |
| B. | Cash expenses | | | | | | | |
| 5. | Hired labour | 800 | 300 | 900 | 1,000 | | | |
| 6. | Hired bullock labour | 700 | 1,000 | 2,000 | 1,300 | | | |
| 7. | Machinery: Fuel and repairs | 500 | 200 | 800 | 1,000 | | | |
| 8. | Fertilizers | 90 | 30 | 180 | 200 | | | |
| 9. | Other crop expenses (seed plant protection measures) | 550 | 50400 | 400 | | | | |
| 10. | Livestock, machinery, veterinary and marketing expenses | 250 | 250 | 150 | 350 | | | |
| 11. | Land rent | 1,000 | 1,500 | 500 | | | | |
| 12. | Interest on current debts, intermediate and long-term debts | 800 | 800 | | | | | |
| 13. | Other miscellaneous expenses | 200 | 450 | 50 | 50 | | | |
| 14. | Land revenue, cess, surcharge and water tax | | 500 | | | | | |
| 15. | Attached farm servant wages | 500 | 100 | 200 | 200 | | | |
| 16. | Total cash expenses | | | | | | | |
| C. | Net cash farm income | | | | | | | |
| | Section: II | Net Capi | tal Flow | | • | • | | |
| D. | Capital Sales | | | | | | | |
| 17. | Milch animals | | 4,150 | 4,000 | | | | |
| 18. | Machinery sales | | 150 | | | | | |
| 19. | Total capital sales | | | | | | | |
| E. | Capital Expenditure | | | | | | | |
| 20. | Improvement repair | 1,000 | 3,200 | | | 4,200 | | |
| 21. | Capital expenditure | | | | | | | |
| F. | Net capital flow (19-21) | | | | | | | |
| | Section: III Ne | et other i | ncome fl | ow | _ | | | |
| G. | Other income | | | | | | | |
| 22. | Off farm income | | 1,000 | 500 | | | | |
| | Non-Farm income | 5,000 | 5,000 | 5,000 | 5,000 | | | |
| 23. | Total other income | | | | | | | |
| H. | Other expenditure | | | | | | | |

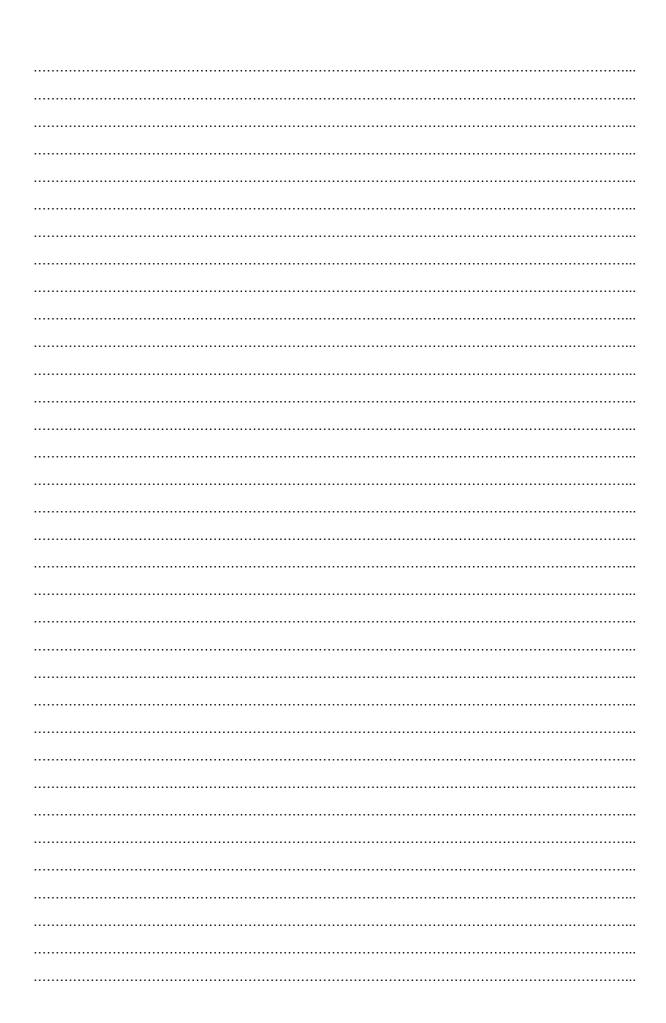
| 24 | Comily living cynoness | 0.000 | 0.500 | 0.050 | 0.000 | |
|----------|--|-------|-------|--------|--------|--|
| 24. | Family living expenses | 6,000 | 2,500 | 3,250 | 3,000 | |
| 25. | Principal payment to intermediate | 2,000 | 3,000 | | | |
| 26. | and long-term loans Total other expenditure | | | | | |
| <u> </u> | Net other income (23-26) | | | | | |
| 27. | Opening Bank Balance | 800 | | | | |
| 28. | Cash on hand | 2000 | 8560 | 14,880 | 12,200 | |
| 29 | Net cash farm income (C) | 2000 | 0000 | 14,000 | 12,200 | |
| 30 | Net Capital Flow (F) | | | | | |
| 31 | Net other income (I) | | | | | |
| 32. | Closing Bank Balance | | | | | |
| JZ. | (27+28+29+30+31) | | | | | |
| | Cash Surplus/Deficit (Write whether it | t l | | | | |
| 33. | is cash surplus or deficit) | | | | | |
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Objective: Preparation and analysis of income Statement- A Case Study

A model income statement or profit – loss statement

| Receipts | Amount | Expenses | Amount |
|------------------------------------|--------|---|--------|
| I. Cash Receipts | | I. Operating Expenses | |
| 1. Paddy sales | 7,500 | 1. Hired labour | 3,000 |
| 2. Sugarcane sales | 5,500 | Hired bullock labour | 4,000 |
| 3. Groundnut sales | 12,000 | 3. Fuel and repairs for machinery | 2,500 |
| 4. Milk sales | 6,500 | 4. Fertilizers | 1,500 |
| 5. Broiler sales | 12,000 | 5. Other crop expenses (seed and spray of chemicals | 2,400 |
| 6. Miscellaneous income (hired out | | Livestock and veterinary | 1,000 |
| human and bullock labour) | 1,500 | expenses | |
| | | 7.Interest on current debt | 600 |
| | | 8. Other miscellaneous expenses | 700 |
| Sub Total | 45,000 | Sub Total | 15,700 |
| II. Net Capital Gain Income | | II. Fixed Expenses | |
| 1. Sale of purchased milch animal | 2,000 | 1. Land rent | 3,000 |
| 2. Sale of farm bred animal | 2,000 | Land revenue, cess and surcharge water charge etc. | 800 |
| 3. Sale of machinery | 2,000 | 3. Land development | 4,200 |
| Sub Total | 6,000 | Interest on intermediate and long-term loan | 1,000 |
| | | 5. Equipment depreciation | 1,500 |
| III. Change in Inventory Value | | 6. Livestock inventory change | 1,000 |
| Crop inventory | 4,000 | 7. Imputed value of family labour | 1,000 |
| Livestock inventory | 1,000 | 8. Building inventory change | 600 |
| Sub-Total | 5,000 | Imputed value of operator's management | 1,500 |
| Gross Farm Income | 56,000 | Sub-Total | 14,600 |
| Net Farm Income | 25,700 | Total Expenses | 30,300 |

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| Exercise: I Prepare an income statement for the period from 1 st October 2018 to 31 st March 2020 of farm using the following information and test the profitability of the farm. Expenses on hired labour Rs. 3000. Hired bullock labour Rs. 4000 Fuel and other expenses for machineries Rs. 2500. Land rent Rs. 3000, land tax, cess and surcharge, water charge etc. Rs. 800, Land development expenses Rs. 4200, Fertilizer expenses Rs. 1500, other crop expenses Rs. 2400, livestock and veterinary expenses Rs. 1000, interest on current debt Rs. 600, Other miscellaneous expenses Rs. 700, Interest on intermediate and long-term loan Rs. 1000, Equipment depreciation Rs 1500, Imputed value of family labour Rs. 1000, Building depreciation Rs. 600, Paddy sales Rs. 7500, sugarcane sales Rs. 5500, teak thinning materials sale Rs. 12000, milk sales Rs. 6500, broiler sales Rs. 12000, miscellaneous income Rs. 1500, Sale of purchased milch animal Rs. 2000, Sale of farm bred animal Rs. 2000, sale of machinery Rs. 2000, crop inventory Rs. 4000 and Livestock inventory Rs. 1000. | | | | | | | | | |
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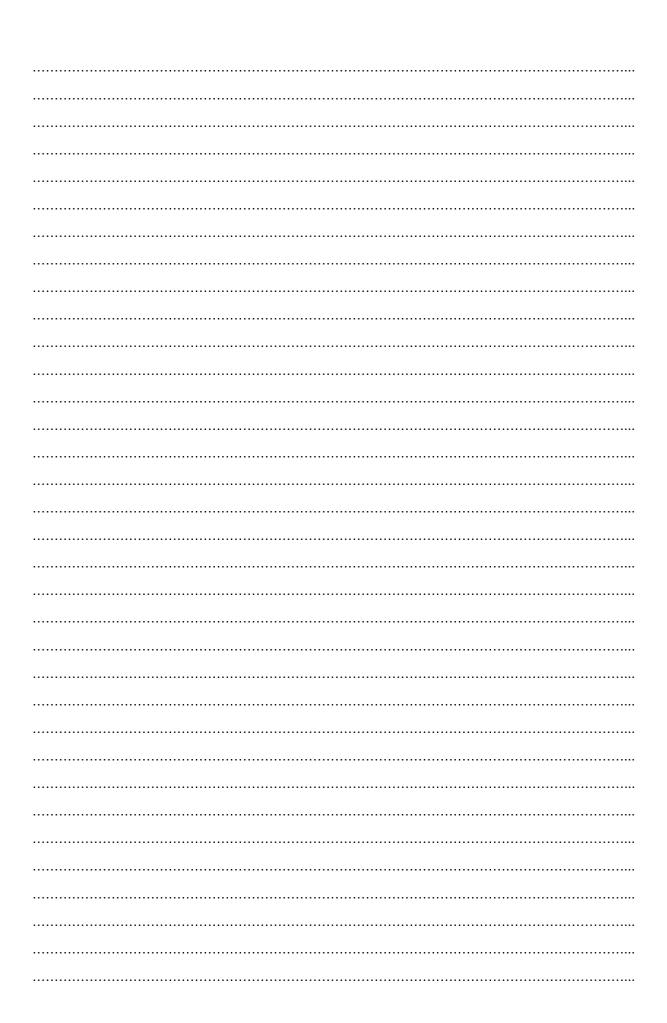
Exercise: 2 Prepare a profit loss statement for the period from 1st July 2018 to 30th September 2019 using the following information.

Mr. Rakesh owns 6 acres of agricultural land. He had cultivated paddy, sugarcane and Casuarina during the year. He had sold 30 quintals of paddy @ Rs.1600 per quintal, 16 tonnes of sugarcane @ Rs. 1735 per tonne, and 20 quintals of groundnut @ Rs. 3,000 /qtl. He has 2 milch animals and a pair of draught animals. He has taken up a small broiler enterprise with 200 birds. The milk sale fetched him Rs. 10,000 during the year. He sold the birds at the rate of Rs. 60 per bird. He hires out the draught animal and earns Rs. 3,000. He sells out a milch animal for Rs. 7,000 and another home bred animal for Rs.3,000. He disposes the old implements available in his farm for Rs.500. He has stored 16.67 quintals of paddy produced during the last year. He incurs a loss of Rs. 2,000 in selling the milch animal. His expenses are as follows:

| - | |
|--|------------|
| Land tax, cess | - Rs.5,000 |
| Attached farm servants | - Rs.2,000 |
| Hired labour | - Rs.6,000 |
| Hired bullock labour | - Rs.4,500 |
| Water charges | - Rs. 600 |
| Maintenance of machinery | - Rs.4,000 |
| Equipment depreciation | - Rs.1,500 |
| Fertilizer purchased | - Rs.2,000 |
| Irrigation structure repairs | - Rs.4,500 |
| Marketing expenses | - Rs.1,800 |
| Interest on current debts | - Rs.1,200 |
| Depreciation on buildings and Implements | - Rs. 850 |
| Other miscellaneous expenses | - Rs.1,600 |
| Interest on intermediate and Long term loans | - Rs.1,000 |
| Livestock inventory | - Rs.1,000 |

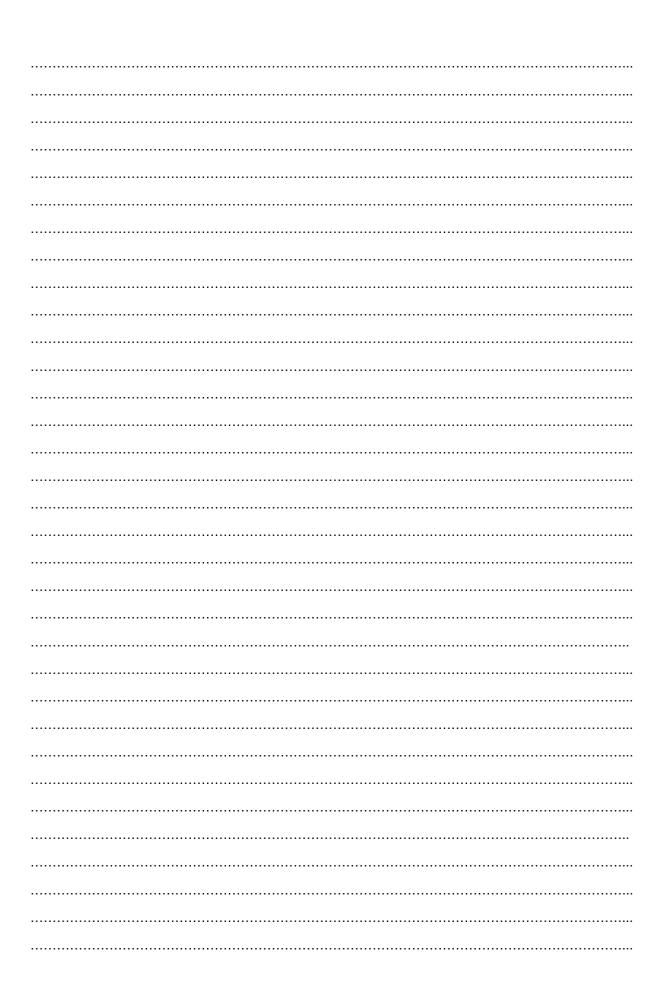
| statement | expenses, and offer yo | our cor | nments. | · | | | |
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Workout the total cash receipts, total net capital gain, changes in inventory value, gross farm income,



Objective: Exercise on financial ratio analysis, Appraisal of Ioan proposals - A Case Study

| Exercise: I Prepare an income statement for the period from 1st October 2018 to 31st March 2019 of farm using the following information and test the profitability of the farm. Expenses on hired labour Rs. 3000. Hired bullock labour Rs. 4000 Fuel and other expenses for machineries Rs. 2500. Land rent Rs. 3000, land tax, cess and surcharge, water charge etc. Rs. 800, Land development expenses Rs 4200, Fertilizer expenses Rs. 1500, other crop expenses Rs. 2400, livestock and veterinary expenses Rs.1000, interest on current debt Rs. 600, Other miscellaneous expenses Rs. 700, Interest on intermediate and long-term loan Rs. 1000, Equipment depreciation Rs. 1500, Imputed value of family labour Rs. 1000, Building depreciation Rs. 600, Paddy sales Rs. 7500, sugarcane sales Rs. 5500, teak thinning materials sale Rs. 12000, milk sales Rs. 6500, broiler sales Rs. 12000, miscellaneous income Rs. 1500, Sale of purchased milch animal Rs. 2000, Sale of farm bred animal Rs. 2000, sale of machinery Rs. 2000, crop inventory Rs. 4000 and Livestock inventory Rs. 1000. |
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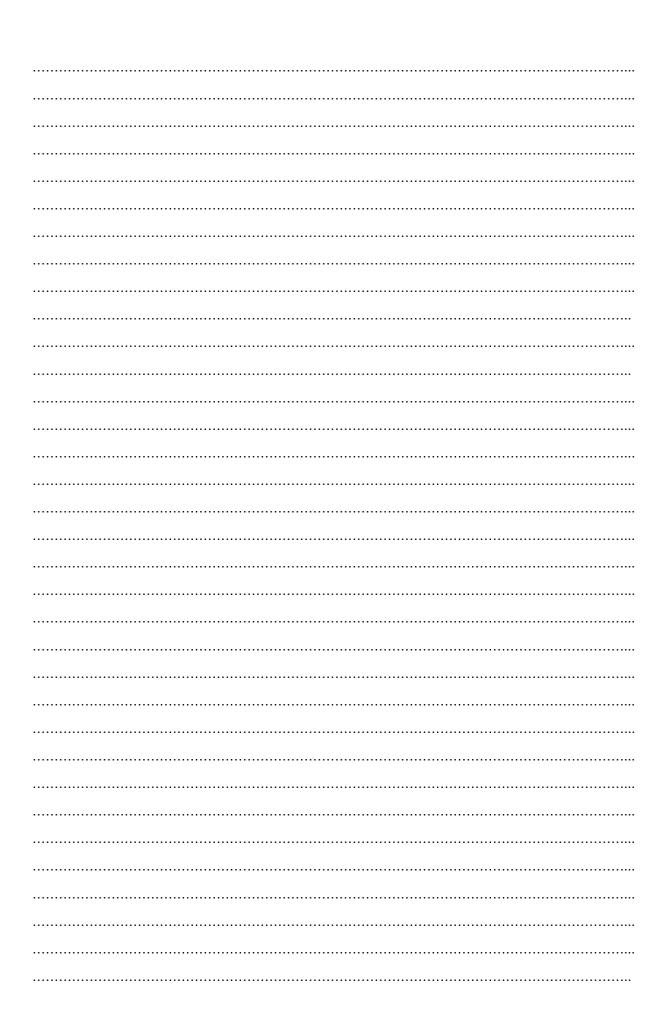
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His expenses are as follows:

| Land tax, cess | - Rs.5,000 |
|--|------------|
| Attached farm servants | - Rs.2,000 |
| Hired labour | - Rs.6,000 |
| Hired bullock labour | - Rs.4,500 |
| Water charges | - Rs. 600 |
| Maintenance of machinery | - Rs.4,000 |
| Equipment depreciation | - Rs.1,500 |
| Fertilizer purchased | - Rs.2,000 |
| Irrigation structure repairs | - Rs.4,500 |
| Marketing expenses | - Rs.1,800 |
| Interest on current debts | - Rs.1,200 |
| Depreciation on buildings and Implements | - Rs. 850 |
| Other miscellaneous expenses | - Rs.1,600 |
| Interest on intermediate and Long term loans | - Rs.1,000 |
| Livestock inventory | - Rs.1,000 |

| Exerci statem | ent | prep | ared | in th | ne pr | revio | us e | xerc | ises. | | | | | | income |
|------------------|-----|------|------|-------|-------|-------|------|------|-------|------|------|------|------|------|--------|
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Exercise No. 11

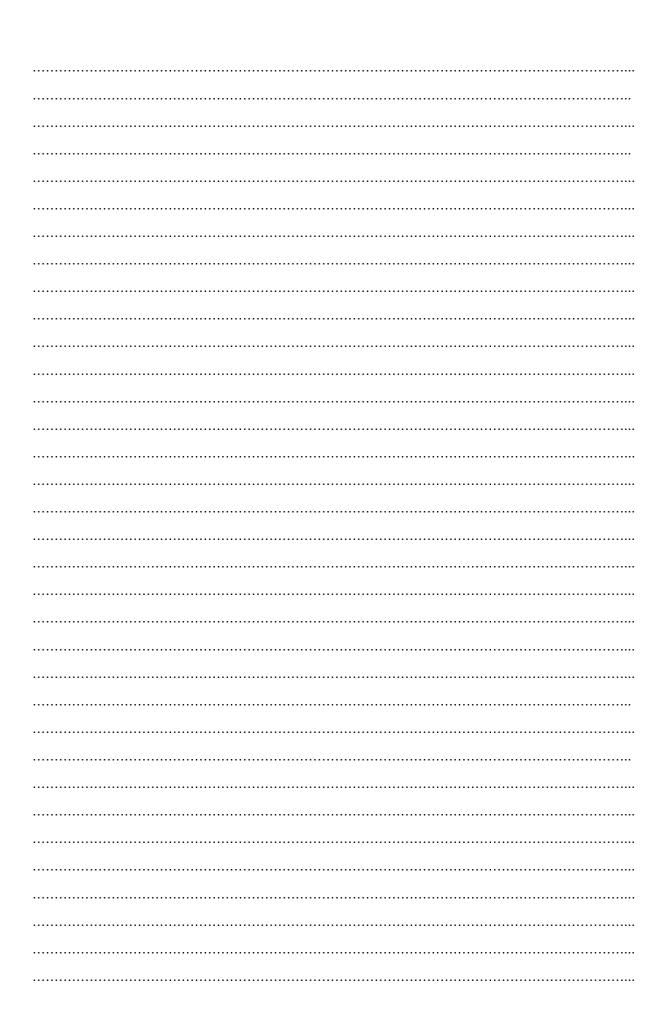
Objective: Estimation of Undiscounted Methods

Exercise 1: Find out feasibility of the above projects based on undiscounted measures

Four Hypothetical Pump Irrigation Projects

| Year | | Increment | Value of | Net value | | | |
|-------------|------------------|---------------------------|------------|---------------|--|----------------------------|--|
| | Capital Items | Operation and maintenance | Production | Gross cost | incremental production (Gross benefit) | of incremental production* | |
| Project I | | | | | | | |
| 1 | 30000 | - | - | 30000 | - | | |
| 2 | - | 2000 | 3000 | 5000 | 20000 | 15000 | |
| 3 | 1 | 2000 | 3000 | 5000 | 20000 | 15000 | |
| 4 | - | - | - | - | - | | |
| Total | 30000 | 4000 | 6000 | 40000 | 40000 | 30000 | |
| Project II | | | | | | | |
| 1 | 30000 | - | - | 30000 | - | | |
| 2 | - | 2000 | 3000 | 5000 | 20000 | 15000 | |
| 3 | - | 2000 | 3000 | 5000 | 20000 | 15000 | |
| 4 | - | 2000 | 3000 | 5000 | 9100 | 4100 | |
| Total | 30000 | 6000 | 9000 | 45000 | 49100 | 34100 | |
| Project III | | | | | | | |
| 1 | 30000 | - | - | 30000 | 1 | | |
| 2 | 1 | 2000 | 3000 | 5000 | 7000 | 2000 | |
| 3 | 1 | 2000 | 3000 | 5000 | 19000 | 14000 | |
| 4 | - | 2000 | 3000 | 5000 | 31000 | 26000 | |
| Total | 30000 | 6000 | 9000 | 45000 | 57000 | 42000 | |
| Project IV | | | | | | | |
| 1 | 30000 | - | - | 30000 | - | | |
| 2 | - | 2000 | 3000 | 5000 | 7000 | 2000 | |
| 3 | - | 2000 | 3000 | 5000 | 31000 | 26000 | |
| 4 | - | 2000 | 3000 | 5000 | 19000 | 14000 | |
| Total | 30000 | 6000 | 9000 | 45000 | 57000 | 42000 | |

| 1000 | 0000 | | 10000 | 0.00 | 1 |
|------|------|---------------------|------------|---------------------|------------------|
| | | mental production i | ncremental | production less the | ne operation and |
| | | the production cost | | | |
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Exercise 2: The gross returns and expenses incurred in cultivation of rain fed oil palm in one hectare is furnished below. Work out the payback period for the project, given the opportunity cost of capital as 16 per cent. Comment on the investment worthiness of the project.

Gross benefit and expenses from rainfed oil Palm Cultivation (Rs. /ha)

| Year | Gross Benefit (GB) | Gross Expenses (GE) |
|------|--------------------|---------------------|
| 1 | 0 | 7307 |
| 2 | 0 | 2313 |
| 3 | 3 0 2768 | |
| 4 | 1305 | 3192 |
| 5 | 2610 | 4040 |
| 6 | 7830 | 4040 |
| 7 | 15660 | 4540 |
| 8 | 13490 | 5540 |
| 9 | 21320 | 6540 |
| 10 | 29150 | 7540 |

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Exercise No. 12

Objective: Estimation of Discounted Methods

Exercise 1: The gross returns and expenses incurred in cultivation of Luciana in one hectare is furnished below. Work out the NPW, BCR and IRR for the project, given the opportunity cost of capital as 16 per cent. Comment on the investment worthiness of the project.

| Year | Cost | Benefit |
|------|-------|---------|
| 0 | 50000 | 0 |
| 1 | 14200 | 26300 |
| 2 | 14200 | 26300 |
| 3 | 14200 | 26300 |
| 4 | 14200 | 26300 |
| 5 | 14200 | 26300 |
| 6 | 14200 | 26300 |
| 7 | 14200 | 26300 |
| 8 | 14200 | 36300 |
| 9 | 14200 | 36300 |
| 10 | 14200 | 42300 |

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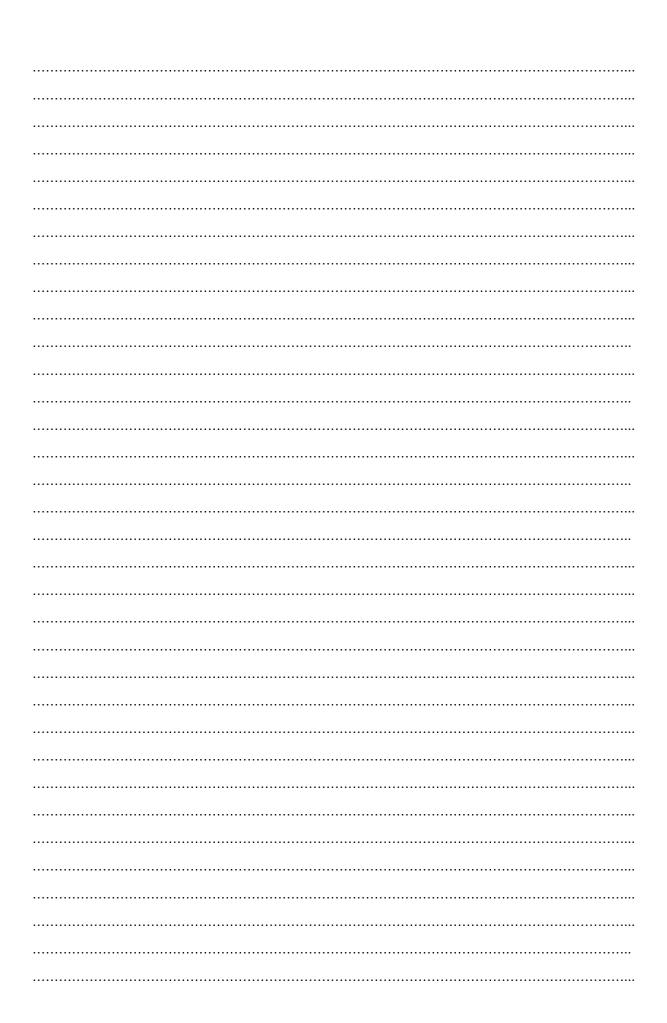
| Exercise 2: A farmer wants to purchase a power tiller at Rs. 60,000 (Year = 0). Every year, the cost of maintenance and returns for the power tiller are estimated at Rs. 14,200 and Rs.28000 respectively. The life period of the power tiller is 10 years. Advise the farmer about the financial worthiness of the purchase of power tiller using NPW, BCR and IRR (The opportunity cost of capital is 16 % per annum). |
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Exercise No. 13

Objective: Preparation of Repayment Plans

| | Example of loan amortization: equal total payment plan. | | | | | | | |
|-------|---|-------------------|-------------|----------------|--|--|--|--|
| Year | · · · · · · · · · · · · · · · · · · · | | | | | | | |
| | Annual payment | Principal payment | Interest | Unpaid balance | | | | |
| | Rs.10,000.00 | | | | | | | |
| 1 | 2,013.03 | 813.03 | 1,200.00 | 9,186.87 | | | | |
| 2 | 2,013.03 | 910.59 | 1,102.44 | 8,276.38 | | | | |
| 3 | 2,013.03 | 1,019.86 | 993.17 | 7,256.52 | | | | |
| 4 | 2,013.03 | 1,142.25 | 870.78 | 6,114.27 | | | | |
| 5 | 2,013.03 | 1,279.32 | 733.71 | 4,834.95 | | | | |
| 6 | 2,013.03 | 1,432.83 | 580.20 | 3,402.12 | | | | |
| 7 | 2,013.03 | 1,604.77 | 408.26 | 1,797.35 | | | | |
| 8 | 2,013.03 | 1,797.35 | 215.68 | 0 | | | | |
| Total | Rs.16,104.24 | Rs.10,000.00 | Rs.6,104.24 | 0 | | | | |

| | Example of loan amortization: equal principal plan. | | | | | | |
|-------|---|-------------------|-------------|----------------|--|--|--|
| Year | | | | | | | |
| | Annual payment | Principal payment | Interest | Unpaid balance | | | |
| | Rs.10,000.00 | | | | | | |
| 1 | 2,450.00 | 1,250.00 | 1,200.00 | 8,750.00 | | | |
| 2 | 2,300.00 | 1,250.00 | 1,050.00 | 7,500.00 | | | |
| 3 | 2,150.00 | 1,250.00 | 900.00 | 6,250.00 | | | |
| 4 | 2,000.00 | 1,250.00 | 750.00 | 5,000.00 | | | |
| 5 | 1,850.00 | 1,250.00 | 600.00 | 3,750.00 | | | |
| 6 | 1,700.00 | 1,250.00 | 450.00 | 2,500.00 | | | |
| 7 | 1,550.00 | 1,250.00 | 300.00 | 1,250.00 | | | |
| 8 | 1,400.00 | 1,250.00 | 150.00 | 0 | | | |
| Total | Rs.15,400.00 | Rs.10,000.00 | Rs.5,400.00 | 0 | | | |



| Exercise 1: Work out repayment plan of long-term loan using equal total payment method and equal principal payment method. The loan amount is Rs.15000/- @ interest rate of 12% per annum and the repayment period of 5 years. |
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| Exercise 2: Work out repayment plan of long-term loan using equal total payment method and equal principal payment method. The loan amount is Rs.50,000/- @ interest rate of 15% per annum and the repayment period of 10 years. |
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Exercise No. 14

Objective: Preparation of bankable projects/ farm Credit proposals and appraisal

Economics of scheme with 10 bee hives: Unit cost, average cash flow and repayment schedule has been worked. The economics have been worked out for a 10 bee boxes model. The economics relates to *Apies mellifera* species of honey bee. The scheme has been found economically viable and details of the same is given below.

Economics of 10 bee hives model

I. Unit Cost

| Α | Fixed Cost | Qty | Amount (Rs) |
|---|--|-----|-------------|
| 1 | Cost of 10 Boxes with Super Queen @ Rs. 2500 | 10 | 25000 |
| 2 | Cost of Frames @ Rs. 250 | 80 | 20000 |
| 3 | Gloves, nets, drums, tray, knife, honey machine & other equipments | | 5000 |
| | Sub- Total | | 50000 |
| В | Variable Cost | | |
| 1 | Sugar @ 2 kg per hives and @ Rs 35/ kg | | 700 |
| 2 | Medicine @ Rs. 30 per hive | | 300 |
| 3 | Cloth to cover boxes (@2 m per box and Rs. 25 per m) | | 500 |
| 4 | Transport for migration | | 6000 |
| 5 | Honorarium to master bee keeper | | 5000 |
| 6 | Other | | 1000 |
| | Sub Total | | 13500 |
| | Grand Total | | 63500 |

Unit cost (A+B)/ Total Cost Bank Loan Rs 63,500.00 Margin 10% Rs 57,100.00 Rs 6400.00

Cash Flow Statement

| SI. | Particulars | I Year | II Year | III Year | IV Year | V Year | VI Year |
|-----|--|--------|---------|----------|---------|--------|---------|
| No | | | | | | | |
| 1 | Honey collection per hive (kg) | 10 | 30 | 35 | 40 | 40 | 40 |
| 2 | Wax produced per hive (kg) | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 3 | Income from sale of honey @ Rs. 100 per kg from 10 | 10000 | 30000 | 35000 | 40000 | 40000 | 40000 |
| | hives | | | | | | |
| 4 | Wax @ 400 per kg from 10 hives | 12000 | 1200 | 1200 | 1200 | 1200 | 1200 |
| 5 | Sale of extra colony | 0 | 5000 | 5000 | 5000 | 5000 | 5000 |
| 6 | Gross Income | 11200 | 36200 | 41200 | 46200 | 46200 | 46200 |
| 7 | Recurring expenses (first year capitalized) | -13500 | - 13500 | 13500 | -13500 | 13500 | -13500 |
| 8 | Gross profit | -2300 | 22700 | 27700 | 32700 | 32700 | 32700 |
| 9 | Depreciation (@ 10% SLM) | 8333 | 8333 | 8333 | 8333 | 8333 | 8333 |
| 10 | Interest @12% | 0 | 13704 | 6612 | 5532 | 3852 | 1992 |
| 11 | Net Income | -10633 | 663 | 12755 | 18835 | 20515 | 22375 |

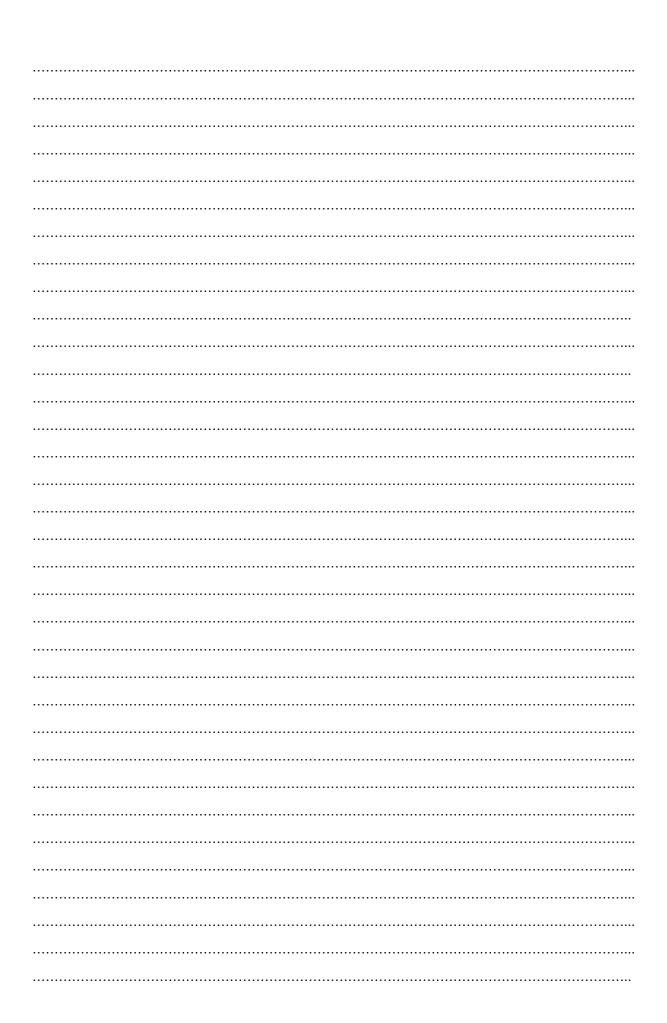
Repayment Schedule:

| ricpayment coneduic. | | | | | | | |
|----------------------|-------------------|----------------|-------------|--------------|-----------|--------|-------------|
| Year | Loan O/S at | Interest @ 12% | Repayment | Repayment | Total | Gross | Loan O/S at |
| | beginning of year | | of interest | of principal | Repayment | profit | end of year |
| 1 | 57100 | 0 | 0 | 0 | 0 | -2300 | 57100 |
| 2 | 57100 | 13704 | 13704 | 2000 | 15704 | 22700 | 55100 |
| 3 | 55100 | 6612 | 6612 | 9000 | 15612 | 27700 | 46100 |
| 4 | 46100 | 5532 | 5532 | 14000 | 19532 | 32700 | 32100 |

| 5 | 32100 | 3852 | 3852 | 15500 | 19325 | 32700 | 16600 |
|-------|-------|------|-------|-------|-------|-------|-------|
| 6 | 16600 | 1992 | 1992 | 16600 | 18592 | 32700 | 0 |
| Total | | | 31692 | 57100 | 88792 | | |

Repayment = Six Years including one year moratorium IRR = >50% Assignment 1. Write your observations about the bankable project given in this exercise

| | Exercise No. 15 |
|---------------|--|
| Objective: | Techno- Economic Parameters for Preparation of Projects for Various Agricultural Products and its Value-Added Products |
| inancial stat | kable project on agricultural products and its value-added products with technical details, ements, financial feasibility tests, repayment plans and present it. |
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| Objective: Seminar on selected topics | Exercise No. 16 |
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