Practical Manual

Agricultural Finance and Cooperation

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

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2020

College of Agriculture
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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. Techno-economic 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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Exercise No. 1

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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Exercise No. 2

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.

Level of financial input (Rs.) (X)	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 combination (use data in 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
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			

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Exercise No. 3

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

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 (crores)	28515	80487	79504	103462	91171	130054	147226	158487	170459	169630
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										

Exercise 1. Work out CAMEL indicators for Cooperative banks

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Exercise No. 4

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

Exercise: Visit to PACB and collect details on administrative set up / management, membership, share capital, sources of fund, area of operation, loans and other facilities provided to farmers and others etc.

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Exercise No. 6

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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Exercise No. 7

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. No.	Item	Physical unit	Value (Rs.)	Working 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 – Depreciation			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.

Sl. No.	Item	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

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

Average: Acreage for small farmer is 1 ha; 2 ha medium farmer; and 5 ha large farmer.

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Exercise No. 8

Objective: Preparation and analysis of balance sheet and cash flow statement- A Case Study

A model balance sheet or net-worth statement

Assets	Amount (in Rs.)	Liabilities	Amount (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	38,500	Hand loans	5,000
Livestock products (eggs, birds etc.)	60,000	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	9,000	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	1,55,000
Total of assets	9,75,500	Total of liabilities Net worth or equity Total of liabilities + Net worth	2,56,000 7,19,500 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.

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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 meant 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

Sl. No.	**Particulars**	**I Quarter July'16-Sep'16**	**II Quarter Oct'16 - Dec'16**	**III Quarter Jan2017-Mar2017**	**IV Quarter Apr2017-Jun2017**	**Yearly Total July 2016 - June 2017**
Section 1: Net cash farm Income						
A.	**Cash Income**					
1.	Crops					
a.	Paddy	7,500	---	10,500	---	
b.	Groundnut	6,000	6,000	---	---	
c.	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**					
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 Capital 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 Net other income flow						
G.	**Other income**					
22.	Off farm income	---	1,000	500	--	
22.a	Non-Farm income	5,000	5,000	5,000	5,000	
23.	**Total other income**	---			---	
H.	Other expenditure					

24.	Family living expenses	6,000	2,500	3,250	3,000	
25.	Principal payment to intermediate and long-term loans	2,000	3,000	---	---	
26.	**Total other expenditure**					
I.	**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)					
30	Net Capital Flow (F)					
31	Net other income (I)					
32.	Closing Bank Balance (27+28+29+30+31)					
33.	Cash Surplus/Deficit (Write whether it is cash surplus or deficit)					

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Exercise No. 9

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		2. 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 human and bullock labour)	1,500		6. Livestock and veterinary expenses	1,000
			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		2. Land revenue, cess and surcharge water charge etc.	800
3. Sale of machinery	2,000		3. Land development	4,200
Sub Total	6,000		4. 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
1. Crop inventory	4,000		7. Imputed value of family labour	1,000
2. Livestock inventory	1,000		8. Building inventory change	600
Sub-Total	5,000		9. 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 1st October 2018 to 31st 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 Attached farm servants	- Rs.5,000 - 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

Workout the total cash receipts, total net capital gain, changes in inventory value, gross farm income, operating expenses, fixed expenses, total expenses and net farm income and prepare income statement and offer your comments.

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Exercise No. 10

Objective: Exercise on financial ratio analysis, Appraisal of loan 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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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 Attached farm servants	- Rs.5,000 - 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

Exercise: Do the tests of liquidity, solvency, and profitability tests for balance sheet and income statement prepared in the previous exercises.

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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	**Incremental cost**				**Value of incremental production (Gross benefit)**	**Net value of incremental production***
	Capital Items	**Operation and maintenance**	**Production**	**Gross cost**		
Project I						
1	30000	-	-	30000	-	
2	-	2000	3000	5000	20000	15000
3	-	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	-	
2	-	2000	3000	5000	7000	2000
3	-	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

The net value of incremental production is the value of incremental production less the operation and maintenance cost 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	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	Loan amount Rs.10,000, annual rate 12% 8 annual payments			
	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	Loan amount Rs.10,000, annual rate 12% 8 annual payments			
	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

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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

A	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**
B	**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 Rs 63,500.00 Margin 10% Rs 6400.00

Bank Loan Rs 57,100.00

Cash Flow Statement

Sl. No	Particulars	I Year	II Year	III Year	IV Year	V Year	VI Year
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 hives	10000	30000	35000	40000	40000	40000
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:

Year	Loan O/S at beginning of year	Interest @ 12%	Repayment of interest	Repayment of principal	Total Repayment	Gross profit	Loan O/S at 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

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Exercise No. 15

Objective: Techno- Economic Parameters for Preparation of Projects for Various Agricultural Products and its Value-Added Products

Prepare bankable project on agricultural products and its value-added products with technical details, financial statements, financial feasibility tests, repayment plans and present it.

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Exercise No. 16

Objective: Seminar on selected topics

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