EASTERN UNIVERSITY, SRI LANKA

SPECIAL REPEAT EXAMINATION

FINAL YEAR 1ST SEMESTER EXAMINATION IN AGRICULTURE – July 2019

EC 4101: PROJECT PLANNING AND INVESTMENT ANALYSIS

PRACTICAL EXAMINATION

Time: **02 hour**　　　　　　　　　　　　　　　　Answer **ALL** questions.

1. a) How is the Discount Factor decided for discounting cash flows?

   b) Write the Discount Factor formula, using standard notations.

   c) What is the purpose of the Discount Factor Table in project appraisal?

   d) If you wish to obtain Rs.500,000 after 10 years, what is the amount of money that has to be invested currently at 8% per year interest rate?　　**(20 marks)**

2. Gayaani FOODS (Pvt.) Ltd. is considering an investment program of Rs.60 Mn. It has a choice of three projects (A,B & C) each of which cost Rs.30 Mn. The firm expects a minimum return of 10% on capital invested.

   Project A　　　　　　**Project B**　　　　　　**Project C**
   Ice Cream Making　　　Fresh Milk Packets　　　Prawn Packaging

   Forecasted **Net Cash (Benefits – Costs) Flows** (Rs.Mn) for the Projects are shown below.

Year	Project A	Project B	Project C
0	30	30	30
1	12	18	24
2	21	12	27
3	27	21	15
4	15	21	15
5	21	19.5	15

   Discount factors (DF) at 10% are provided in the Discount Factor table attached.

   Using the above information perform an **investment appraisal of the 3 projects** using the **Net Present Value (NPV) approach** and identify which of the projects can be recommended for investment to the firm. Justify your answer clearly.
   (30 marks)

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3. Renuka Agric. Ltd. is interested in investing in a paddy mill to process raw paddy into rice for sale to consumers locally. The total investment on the Rice Mill is Rs.6 million. The rice mill has a life time of 20 years of operation and the benefits are the sale of milled rice packets and rice bran & husks. Details of the rice mill investment and operations are shown in the Table below.

Year	Construction Costs	Operating Costs	Sale of Rice packets	Sale of Rice Bran & Husks
1	3,000,000	0	0	0
2	3,000,000	0	0	0
3	0	200,000	500,000	100,000
4	0	200,000	500,000	100,000
5	0	200,000	500,000	100,000
6	0	200,000	500,000	100,000
7	0	200,000	600,000	150,000
8	0	300,000	700,000	150,000
9	0	300,000	700,000	150,000
10	0	400,000	700,000	150,000
11	0	400,000	800,000	150,000
↓	↓	↓	↓	↓
20	0	400,000	800,000	150,000

Using the above information about the Rice Mill investment combined with a discount rate of 6% (Discount factor table is provided);

i)   Calculate the **Net Present Value (NPV)** and **Benefit Cost Ratio (BCR)** and

ii)   Estimate the **Internal Rate of Return (IRR)** of the investment.

(30 marks)

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4. The Table below shows the **Activity Chart** for a project which indicates the activities/tasks, tasks duration, dependencies and the milestones.

Activity / Tasks	Duration (Weeks)	Dependencies
T1	8	-
T2	15	-
T3	15	T1 (M1)
T4	10	-
T5	10	T2, T4 (M2)
T6	5	T1, T2 (M3)
T7	20	T1 (M1)
T8	25	T4 (M5)
T9	15	T3, T6 (M4)
T10	15	T5, T7 (M7)
T11	7	T9 (M6)
T12	10	T11 (M8)

Using the above data of the project; answer the following questions.

i) What is the minimum total duration of this project?
ii) Draw the **GANTT Chart** /Activity Bar Chart showing all the activities/tasks.
iii) Draw the **Activity Network diagram** clearly showing all the tasks, dependencies and milestones.

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Discount Factor Table

DISCOUNT FACTOR (p.a.) FOR A RANGE OF DISCOUNT RATES

Present Value of $1 in the Future at Discount Rate r%

Year	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
0	1	1	1	1	1	1	1	1	1	1	1	1	1
1	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696
2	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561
3	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575
4	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718
5	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972
6	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323
7	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759
8	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269
9	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843
10	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472
11	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149
12	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869
13	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625
14	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413
15	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229
16	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069
17	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929
18	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808
19	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703
20	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611
21	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531
22	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462
23	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402
24	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349
25	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304
26	0.4637	0.3607	0.2812	0.2198	0.1722	0.1352	0.1064	0.0839	0.0663	0.0525	0.0417	0.0331	0.0264
27	0.4502	0.3468	0.2678	0.2074	0.1609	0.1252	0.0976	0.0763	0.0597	0.0469	0.0369	0.0291	0.0230
28	0.4371	0.3335	0.2551	0.1956	0.1504	0.1159	0.0895	0.0693	0.0538	0.0419	0.0326	0.0255	0.0200
29	0.4243	0.3207	0.2429	0.1846	0.1406	0.1073	0.0822	0.0630	0.0485	0.0374	0.0289	0.0224	0.0174
30	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151
31	0.4000	0.2965	0.2204	0.1643	0.1228	0.0920	0.0691	0.0521	0.0394	0.0298	0.0226	0.0172	0.0131
32	0.3883	0.2851	0.2099	0.1550	0.1147	0.0852	0.0634	0.0474	0.0355	0.0266	0.0200	0.0151	0.0114
33	0.3770	0.2741	0.1999	0.1462	0.1072	0.0789	0.0582	0.0431	0.0319	0.0238	0.0177	0.0132	0.0099
34	0.3660	0.2636	0.1904	0.1379	0.1002	0.0730	0.0534	0.0391	0.0288	0.0212	0.0157	0.0116	0.0086
35	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075
36	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065
37	0.3350	0.2343	0.1644	0.1158	0.0818	0.0580	0.0412	0.0294	0.0210	0.0151	0.0109	0.0078	0.0057
38	0.3252	0.2253	0.1566	0.1092	0.0765	0.0537	0.0378	0.0267	0.0190	0.0135	0.0096	0.0069	0.0049
39	0.3158	0.2166	0.1491	0.1031	0.0715	0.0497	0.0347	0.0243	0.0171	0.0120	0.0085	0.0060	0.0043
40	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037