UNIVERSITY OF COLOMBO, SRI LANKA
FACULTY OF ARTS

FOURTH YEAR EXAMINATION IN ARTS (ECONOMICS)-2021/2022
(End of First Semester)
ECN 4191 – ECONOMICS OF RISK MANAGEMENT
TIME ALLOWED: TWO (2) HOURS

PART – I
Answer any TWO (2) Questions from Part I

Question No. 1 [25 Marks]

i. How do you define "Risk" and "Uncertainty"? Explain your answer while showing the differences between "Risk" and "Uncertainty". **[07 Marks]**

ii. Based on the historical analysis, the values of **stock A** which is listed in stock exchange follows the following probability distribution.

X (Value of stock A)	4.80	9.60	14.40	19.20	24.00
Pr (X=x)	0.10	0.20	0.30	0.20	0.20

Calculate the Expected value, Standard Deviation and the Coefficient of Variance of **stock A.** **[08 Marks]**

iii. In addition to the **stock A** explained in the part (ii), an investor knows the following probability distribution for **stock B**. It is listed in the same stock exchange.

Y= (Value of stock B)	5.00	10.00	15.00	20.00	60.00
Pr (Y=y)	0.40	0.10	0.30	0.10	0.10

What would be your opinion on the above two investment opportunities, if an investor needs to know which investment would give a better return. **[10 Marks]**

Question No. 2 – [25 Marks]

You have given the following information for a certain financial project:

- Initial investment for the project is 3.0 Mn
- Net Income cash flows (CF) follows the following probability distribution for a given year.

Probability	0.05	0.25	0.35	0.20	0.15
Net Income CF (Mn)	0.8	0.9	1.2	1.0	1.0

- Lifetime of the Project is 4 years and Net Income CF will be realized at the end of each year.
- Cash Flows are serially dependent on each year.
- Market Opportunity cost is 15% and the associated Risk Premium is 5%.

i. Calculate the expected value of the cash flow (E[CF]) and the standard deviation of the cash flow (SD[CF]) end of each year for the above project. **[07 Marks]**

ii. Calculate the E[NPV] and the Sigma [NPV] for the above project. (NPV stands for the Net Present Value) **[10 Marks]**

iii. If the NPV follows a normal probability distribution then calculate the **Pr[NPV >0].** By using the fact that **Pr[NPV >0]**, how would you explain the criteria to an investor whether this project could be accepted or rejected? **[08 Marks]**

Question No. 3 – [25 Marks]

i. What is Information Asymmetry? Explain the methods used in insurance business to overcome issues related with information asymmetry. [8 Marks]

ii. When buying a health insurance cover for my family, some important historical health-related issues of my children had not been made known to the insurer. Critically examine my position pertaining to obtaining benefits from the insurance contract I bought. [8 Marks]

iii. Consider the following situations. Critically analyse the situation and provide your opinion based on the basic principles of insurance you have studied. [3 Marks each]

   a. I want to insure my girl/boyfriend's life. But the insurance agent said I cannot do that. I was very disappointed. Can you explain why I could not insure my girl/boyfriend's life?

   b. A person having insured his life for Rs 5 million has lost his both hands due to a tragic road accident. The person was not at fault. He is claiming Rs 5 million from the insurer. Examine whether he would be successful.

   c. A businessman has insured his newly bought plant at two insurers. Will his new plant be compensated by both insurers in the event of an accident, such as fire or breakdown? Briefly explain your answer.

Question No. 4 – [25 Marks]

Insurance is a means of protection from financial loss in which, in exchange for a fee, a party agrees to guarantee another party compensation in the event of a certain loss, damage, or injury. It is a form of risk management, primarily used to hedge against the risk of a contingent or uncertain loss.

i. In the above context, explain what Marine Insurance is? [03 Marks]

ii. What are the excluded risks under Institute Cargo Clause (ICC), (A) [05 Marks]

iii. In the event of a claim to be lodged by consignee for loss or damaged to cargo, what are the documents required to be submitted? [03 Marks]

iv. Discuss "Warranty" in Insurance. [07 Marks]

v. Explain "Average" in Marine Insurance and give the conditions that a ship may declare General Average. [07 Marks]

PART - II
Answer any TWO (2) Questions from Part II

Question No. 5 – [25 Marks]

i. What is meant by 'underwriting' in life insurance? [05 Marks]

ii. Identify two (02) Additional Benefits that may be offered with a life insurance product and explain the coverage provided by each of them. [10 Marks]

iii. Explain the five (05) options (underwriting decisions) that are available for an underwriter after evaluating a proposal form for life insurance? [10 Marks]

Question No. 6 – [25 Marks]

i. Explain the two main types of reinsurance arrangements including the advantages and disadvantages of each of them. [10 Marks]

ii. Sunil is a small-scale entrepreneur who manufactures bottled fruit drinks under the trade name 'Nectar by Sunil'. He has five employees working for him and he operates his manufacturing plant from his residence. He has a delivery van used for distribution of his products.

You are meeting Sunil to advise him on risk management for his business with particular reference to how insurance can support his business to sustain and grow. You are required to prepare a memo to Sunil detailing the risks that his business is exposed to and how he can manage those risks using insurance products that are available in the market. You will need to explain the coverage and exclusions applicable to the products that you are recommending to Sunil. [15 Marks]

Question No. 7 – [25 Marks]

i. Explain the reasons for the low level of insurance penetration in Sri Lanka. [10 Marks]
ii. Identify and describe a few policy measures that can be taken by the Government and the Insurance Regulator to increase insurance penetration in the country. [15 Marks]
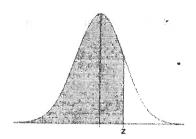
Question No. 8 – [25 Marks]

i. Explain the Law of Large Numbers and describe its relevance to the insurance industry. [10 Marks]
ii. Identify and describe 3 distribution channels through which insurance products are marketed in Sri Lanka highlighting their unique features. [15 Marks]

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Standard Normal Cumulative Probability Table

Cumulative probabilities for POSITIVE z-values are shown in the following table:

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Standard Normal Cumulative Probability Table

Cumulative probabilities for NEGATIVE z-values are shown in the following table:

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641