



**UNIVERSITI KUALA LUMPUR
BUSINESS SCHOOL**

**FINAL EXAMINATION
JULY 2024 SEMESTER**

COURSE CODE	: EIB10903
COURSE NAME	: FINANCE 2
PROGRAMME NAME	: BACHELOR OF BUSINESS ADMINISTRATION (HONS) IN MANAGEMENT AND ENTREPRENEURSHIP
DATE	: 24 SEPTEMBER 2024
TIME	: 9.00 PM – 12.00 PM
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **FIVE (5)** questions.
4. Answer **only FOUR (4)** questions.
5. Please write your answers on the answer booklet provided.
6. All questions must be answered in **English** (any other language is not allowed).
7. **This question paper must not be removed from the examination hall.**
8. Present and future values tables has been appended for your reference.

THERE ARE NINE (9) PAGES OF QUESTIONS, INCLUDING THIS PAGE.

INSTRUCTION: Answer ANY FOUR (4) questions.

Please use the answer booklet provided.

Question 1

a) Carefully describe the risk-return trade-off faced by all investors.

(10 marks)

b) "A risk-averse investor will not assume risk." Agree or disagree with this statement, and explain your reasoning.

(5 marks)

c) From an issuer's standpoint, explain the distinction between Fannie Mae and Ginnie Mae.

(5 marks)

d) Why is the common stockholder referred to as a "residual claimant"?

(5 marks)

[Total: 25 marks]

Question 2

a) Define "open-end" with regard to an investment company's capitalization and explain the different between "closed-end".

(5 marks)

b) Discuss the advantages and disadvantages of a limit order versus a market order. How does a stop order differ from a limit order?

(5 marks)

c) Why do people say "The losses on short selling are unlimited?"

(5 marks)

d) The following is an extract from the Statement of Financial Position of Venus Company:

	RM'000
Common Stock (RM 2 par value)	RM 5,000
Premium	RM 10,000
Retained Earnings	RM 20,000
Total Equity	RM 35,000

The company is considering giving 20 percent stock dividends to its shareholders and the current market price of shares is RM 8. Show the effect on the Statement of Financial Position after providing the stocks dividends.

(10 marks)

[Total:25 marks]

Question 3

a) Define dividend discount model. Write this model in equation form.

(3 marks)

b) Maxim Consulting Company is currently selling for RM30, paying RM1.20 in dividends, and investors expect dividends to grow at constant rate of 5 percent a year.

i. If an investor requires a rate of return of 14 percent for a stock with the riskiness of Maxim Company, is it a good buy for this investor?

(4 marks)

ii. What is the maximum an investor with a 14 percent required return should pay for Maxim Company? What is the maximum if the required return is 15 percent?

(4 marks)

c) The Parker Dental Supply Company sells at RM36 per share, and Ray Parker, the CEO of this well – known Research Triangle firm, estimates the latest 12-month earnings are RM3.00 per share with a dividend payout of 50 percent. Dr. Parker's estimates are very accurate.

i. What is the Parker's current Price Earning (P/E) ratio?

(4 marks)

- ii. If an investor expects earnings to grow by 10 percent a year, what is the projected price for next year if the P/E ratio remains unchanged?

(4 marks)

- iii. Dr. Parker analyzes the data and estimates that the payout ratio will remain the same. Assume the expected growth rate of dividends is 10 percent, and an investor has a required rate of return of 16 percent, would this stock be a good buy? Justify your answer.

(6 marks)

[Total: 25 marks]

Question 4

a) **Khazanah returns to dollar bond market with US\$1.5bil dual-tranche issuance**

KUALA LUMPUR: Khazanah Nasional Bhd has reopened the country's US dollar sukuk and bond market by issuing a dual-tranche senior offering worth US\$1.5 billion. The sovereign wealth fund said the offering consists of a five-year US\$750 million sukuk maturing in 2028 and a 10-year US\$750 million conventional bond maturing in 2033.

The issuance marks Khazanah's first US dollar-rated sukuk and corporate bond out of its newly established US\$5.0 billion multicurrency sukuk issuance programme and US\$10.0 billion-euro medium term note programme through its wholly-owned special purpose vehicles Khazanah Global Sukuk Bhd and Khazanah Capital Ltd.

Khazanah's last issuance was the unrated sukuk of US\$1.0 billion in 2021. According to Khazanah, the bonds were launched at an initial price guidance of 135 basis points (bps) over the five-year US Treasury yield and 160bps over the 10-year US Treasury yield for the five-year sukuk and 10-year conventional bond respectively.

It said the transaction had garnered strong demand, attracting over 200 investors across Asia, Europe and the Middle East, with an oversubscription of more than seven times. The order book reached a peak of US\$12 billion which led Khazanah to revise the price guidance tighter to 93bps and 118bps, issuing the bonds at 4.687 per cent and 4.876 per cent respectively.

The bonds will be listed on Bursa Malaysia (under an Exempt Regime), Labuan International Financial Exchange Inc and the Singapore Exchange Securities Trading Ltd. Khazanah managing director Datuk Amirul Feisal Wan Zahir said investors recognised it as a strategic investor and an intergenerational fund capable of withstanding short-term market volatility.

Amirul said the issuance, which was carried out amid volatile market conditions, would be the benchmark for Khazanah's credit. "Proceeds will be utilised for general investments, refinancing of borrowings, and working capital requirements of Khazanah," he said.

BofA Securities Inc, CIMB Group Holdings Bhd, DBS Bank Ltd, JP Morgan, Malayan Banking (Maybank), Mitsubishi UFJ Financial Group Inc (MUFG) and OCBC Bank (M) Bhd were joint lead managers and joint bookrunners for the issuance.

News Strait Times, 25 May 2023

- i. According to News Strait Times issued on 25 May 2023 above, discuss what type of financing have been used by Khazanah Nasional Bhd?
(2 marks)
 - ii. Discuss any **FOUR (4)** advantages obtained by Khazanah through bond issuance.
(8 marks)
 - iii. In your opinion, critically explain why Khazanah Nasional Bhd would issue bonds instead of just borrowing from a bank and issuing stocks.
(4 marks)
- b) Victory Berhad is interested in investing in bonds and currently evaluating Bond A and Bond B. Bond A pays 8% coupon semiannually and matures in 12 years. Bond B pays 6% coupon annually and has a maturity period of 15 years.
- Determine the value of each bond if the current market yield for both bonds is 8%. Assume Bond A is currently selling at RM980 while Bond B is selling at RM940. Which bond would Victory Berhad buy? Explain your answer.
- (5 marks)
- c) A 10 % percent coupon bond with a par value of RM1,000 matured in 13 years. It is currently sold at RM920. Despite of that, the issuer may expect to call back the bond after 8 years at RM1,100. Determine the following:

- i. Yield to maturity.

(3 marks)

- ii. Yield to call.

(3 marks)

[25 Marks]

Question 5

- a) The mood on MariBank was very bullish when they proposed to acquire HengBank at RM4.26 billion. The proposed acquisition will see MariBank emerge as the single largest shareholder in HengBank. Most analysts and stock broking firms believe that the share price would continue to rise. To bet on this expectation, Rizal buys 1500 units of MariBank September RM 8.00 call option for 50 cents per share. Currently the shares are traded at RM9.50. Calculate the profit if the holder expectation is accurate.

(5 marks)

- b) KKM's shares are currently selling at RM40. Expecting that the price will drop by 40% in three months time, an investor has decided to buy 3 months option, which enables him to sell 5 lots of KKM shares at striking price of RM40. The total option premium is RM800. If the investor's price estimation is correct and he exercise the option, how much profit or loss would he make?.

(5 marks)

- c) AZ Berhad issued a warrant that entitles the holder to buy two units of common share at RM10. If the current market price of the share is RM14 and the warrant is priced at RM3, calculate:

- i. The theoretical value.

(2 marks)

- ii. The warrant premium.

(2 marks)

- iii. Should the holder exercise the warrant? Why?

(2 marks)

- iv. What will happen to the market price of the warrant if the share is traded at RM13, and the premium remains the same?

(4 marks)

- v. Differentiate between warrants and options.

(5 marks)

[25 Marks]

END OF EXAMINATION PAPER

TABLE 1: Present Value Interest Factors

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	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	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	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	0.7432	0.6944	0.6504	0.6400	0.5917
3	0.9706	0.9423	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	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	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	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	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	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	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	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	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	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	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	0.3050	0.2326	0.1789	0.1678	0.1226
9	0.9143	0.8368	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	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	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	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	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	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	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	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	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	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	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	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	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	0.1079	0.0649	0.0397	0.0352	0.0195
16	0.8528	0.7284	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	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	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	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	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	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	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	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	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	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	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	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	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	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	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	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	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	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	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	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	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	0.0116	0.0042	0.0016	0.0012	*
35	0.7059	0.5000	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	0.0055	0.0017	0.0005	*	*
36	0.6989	0.4902	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	0.0048	0.0014	*	*	*
40	0.6717	0.4529	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	0.0026	0.0007	*	*	*
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	*	*	*	*

TABLE 2: Present Value Interest Factors Annuity

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	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	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4568	1.4400	1.3609
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1662
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.6046	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5680	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.255	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	4.5327	3.9124	3.7801	3.2233
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755	4.6755	4.0013	3.8593	3.2682
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0799	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731	4.8913	4.1212	3.9631	3.3198
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587	6.0113	4.9094	4.1300	3.9705	3.3230
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802	8.8932	8.2664	7.7184	7.2297	6.7921	6.3988	6.0442	4.9245	4.1371	3.9764	3.3254
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338	6.0726	4.9371	4.1428	3.9811	3.3272
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971	4.9476	4.1474	3.9849	3.3286
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.4269	8.6938	8.0552	7.4957	7.0027	6.5860	6.1772	4.9789	4.1601	3.9950	3.3321
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.6442	8.8552	8.1755	7.5856	7.0700	6.6166	6.2153	4.9915	4.1644	3.9984	3.3330
36	30.108	25.489	21.832	18.908	16.547	14.671	13.035	11.717	10.612	9.6765	8.8786	8.1924	7.5979	7.0790	6.6231	6.2201	4.9929	4.1649	3.9987	3.3331
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.7791	8.9511	8.2438	7.6344	7.1050	6.6418	6.2335	4.9966	4.1659	3.9995	3.3332
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605	6.2463	4.9995	4.1666	3.9999	3.3333

List of formulas

$$1. \quad Vb = \frac{CR \times PV}{m} \left(PVIFA \frac{k}{m}, n \times m \right) + PV \left(PVIF \frac{k}{m}, n \times m \right)$$

$$2. \quad YTM = \frac{\frac{CR \times PV}{m} + \frac{PV - MP}{n \times m}}{\frac{PV + MP}{2}}$$

$$3. \quad YTC = \frac{\frac{CR \times PV}{m} + \frac{Call Price - MP}{n \times m}}{\frac{Call Price + MP}{2}}$$

$$4. \quad P_0 = \frac{D_0(1 + g)}{k - g}$$

$$5. \quad \text{Profit/Loss} = (MP - SP) - OP$$

$$6. \quad \text{Profit/Loss} = (SP - MP) - OP$$

$$7. \quad \text{Theoretical Price (TP)} = (MP_{CS} - EP) \times ER$$

$$8. \quad \text{Warrant or Speculative Premium (WP)} = MP_W - TP$$

$$9. \quad \text{NOS (old)} = \frac{CS}{PV}$$

$$\text{NOS (D)} = D (\%) \times \text{NOS (old)}$$

$$CS (\text{new}) = [\text{NOS (old)} + \text{NOS(D)}] \times PV$$

$$10. \quad \text{Increase in Premium} = (MP - PV) \times \text{NOS(D)}$$

$$\text{New Premium} = \text{Pre (old)} + \uparrow \text{ in Premium}$$

$$11. \quad \text{Reduction in R/E} = MP \times \text{NOS(D)}$$

$$\text{New RE} = \text{RE} - \downarrow \text{ RE}$$

$$12. \quad \text{New PV} = \frac{\text{Old PV}}{\frac{a}{b}}$$

$$PV (\text{new}) = \frac{PV (\text{old})}{\frac{a}{b}}$$

$$13. \quad \text{NOS (new)} = \text{NOS (old)} \times a/b$$