



MNF3015 (490389)
RMF301X (473507)

May/June 2011

FINANCIAL MANAGEMENT (BUSINESS MANAGEMENT 301)

Duration 2 Hours

70 Marks

EXAMINERS ·
FIRST
SECOND
EXTERNAL

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Use of a non-programmable pocket calculator is permissible

This paper consists of 20 pages including Appendix A (pp 17-20), (pages for rough work) Appendix B (pp i-iv), (interest tables) and instructions for the completion of a mark reading sheet

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INSTRUCTION:

SECTION A: Answer 40 multiple choice questions on the mark reading sheet.
SECTION B: Answer the two long questions using the space provided below the questions. No rough work will be marked.

[TURN OVER]

SECTION A (40 MARKS)

- 1 One basic technique used to determine after-tax operating cash flows is to
 - 1 add noncash charges to net income
 - 2 subtract depreciation from operating revenues
 - 3 add cash expenses to net income
 - 4 subtract cash expenses from noncash charges

- 2 Benefits expected from proposed capital expenditure must be on an after-tax basis because
 - 1 taxes are cash outflows
 - 2 no benefits may be used by the firm until tax claims are satisfied
 - 3 there may also be tax benefits to be evaluated
 - 4 it is common, accepted practice to do so

- 3 If an investment project has a positive net present value, then the internal rate of return is
 - 1 less than the cost of capital
 - 2 greater than the cost of capital
 - 3 equal to the cost of capital
 - 4 indeterminate, it depends on the length of the project

- 4 For acceptable investments, the reinvestment assumption under the internal rate of return is generally
 - 1 higher than under the net present value method
 - 2 lower than the net present value
 - 3 at the cost of capital
 - 4 below the cost of capital

- 5 Throb-Hearts Private Limited is considering the replacement of an old machine with one that has a purchase price of R70 000. The current market value of the old machine is R25 000 and the book value is R32 000. The firm's tax rate for ordinary income is 28%. The net cash outflow for the new machine after considering the sale of the old machine is
 - 1 R38 000
 - 2 R43 040
 - 3 R45 000
 - 4 R49 100

[TURN OVER]

- 6 The Tenderpreneur Corporation has the following investment opportunities

Year	Machine A	Machine B	Machine C
0	-R 15 000	-R 22 500	-R37 500
1	6 000	12 000	-
2	9 000	12 000	30 000
3	3 000	10 500	30 000
4	-	10 500	15 000

Using the payback method and assuming these machines are mutually exclusive, which machine(s) would Tenderpreneur Corporation choose?

- 1 Machine A
 - 2 Machine B
 - 3 Machine C
 - 4 Machine A and B
- 7 The Red Ants CC runs an investment project that will reduce expenses by R15 000 per year over the next 3 years. The project will cost R20 000. The asset is depreciated at 33% in the first year, and the company's tax rate is 28%. The cash flow in year 1 equals
- 1 R 6 800
 - 2 R 5 100
 - 3 R11 667
 - 4 R12 648
- 8 Project A has a R5 000 net present value at a zero discount rate and an internal rate of return of 12%. Project B has a R8 000 net present value at a zero percent discount rate and an IRR of 10%. If the projects are mutually exclusive, which one should be chosen given that the cost of capital is 6%?
- 1 Project A, because it has a higher internal rate of return
 - 2 Project B if the cross over point is above the cost of capital
 - 3 Both projects if the net present value is positive
 - 4 Not enough information
- 9 A correlation coefficient of zero indicates that
- 1 the projects have the same expected value
 - 2 there is no correlation and no risk reduction when the projects are combined
 - 3 there is no correlation, but some risk reduction when the projects are combined
 - 4 the projects have the same standard deviation

[TURN OVER]

10 Which investment has the least amount of risk?

- 1 Standard deviation =R500, expected return = R5 000
- 2 Standard deviation =R700, expected return = R 500
- 3 Standard deviation =R900, expected return = R 800
- 4 Standard deviation =R400, expected return = R 350

11 When evaluating portfolio risk, the investor

- 1 needs to consider the impact of a given project on the overall risk of the firm
- 2 recognises that a risky investment may create a portfolio with less risk
- 3 needs to consider how the returns of the projects in the portfolio are correlated
- 4 all of the above

12 Le Botho CC is considering investment in a project about which its analysts have projected the following outcomes and their probabilities

Outcome	Probability of outcome	Assumptions
R 5 250	25%	pessimistic
7 800	45%	moderately successful
13 500	30%	optimistic

The expected value of the outcomes is closest to

- 1 R3 123
 - 2 R8 460
 - 3 R8 873
 - 4 R9 126
- 13 A project has a coefficient of variation of 0.4, a positive correlation of 0.20 and its expected value is R2 000. The standard deviation is closest to
- 1 R 400
 - 2 R 500
 - 3 R 800
 - 4 R1 000

[TURN OVER]

The following information refers to questions 14 and 15:

A blue chip company must choose from six capital budgeting proposals outlined below in table A. The firm is subject to capital rationing and has a capital budget of R1 000 000, the firm's cost of capital is 15%

Table A

Project	Initial investment	IRR	NPV
1	R200 000	19%	R100 000
2	400 000	17	20 000
3	250 000	16	60 000
4	200 000	12	-5 000
5	150 000	20	50 000
6	400 000	15	150 000

- 14 Using the internal rate of return approach to ranking projects, which projects should the firm accept?
- 1 1, 2, 3 and 5
 - 2 1, 3, 4 and 6
 - 3 1, 2, 3, 4 and 5
 - 4 2, 3, 4 and 6
- 15 Using the net present value approach to ranking projects which projects should the firm accept?
- 1 2, 3, 4 and 5
 - 2 1, 2, 3, 5 and 6
 - 3 1, 3, 5 and 6
 - 4 1, 2, 3, 4 and 5

The following information refers to questions 16, 17, 18, 19 and 20:

Zimlili Importers a KwaZulu-Natal-based import company is evaluating two mutually exclusive projects A and B. The relevant cash flows for each project are given in table C below. The cost of capital for use in evaluating each of these equally risky projects is 10%

Table C

Year	Project A	Project B
0	(R450 000)	(R350 000)
1	150 000	175 000
2	135 000	150 000
3	170 000	125 000
4	50 000	-
5	75 000	-
6	50 000	-

[TURN OVER]

16 The NPVs of projects A and B are equal to

- 1 -R 34 600 and -R 26 972 respectively
- 2 R934 600 and R726 972 respectively
- 3 R 34 600 and R 26 972 respectively
- 4 R199 480 and -R 48 027 respectively

17 The annualised NPV of project A is closest to

- 1 R6 459
- 2 R7 643
- 3 R7 945
- 4 R8 549

18 The annualized NPV of project B is

- 1 R 9 948
- 2 R10 849
- 3 R11 673
- 4 R12 227

19 Which project should be chosen on the basis of the normal NPV approach?

- 1 Project A
- 2 Project B
- 3 neither
- 4 both

20 Which project should be chosen using the annualised NPV approach?

- 1 Project A
- 2 Project B
- 3 neither
- 4 both

The following information refers to questions 21, 22, 23 and 24:

The Starback Company's optimal capital structure calls for 30% debt and 70% equity. The interest rate on its debt is a constant 12%, its cost of ordinary shares funding from retained earnings is 15%, and its marginal tax rate is 28%. Starback has the following opportunities:

Project A cost = R70 000, IRR = 16.5%
Project B cost = R70 000, IRR = 15.2%
Project C cost = R40 000, IRR = 12.4%
Project D cost = R60 000, IRR = 10.1%

Starback has R120 000 in available earnings.

[TURN OVER]

- 21 The weighted average cost of capital for Starback Company is equal to
- 1 9.1%
 - 2 11.2%
 - 3 13.1%
 - 4 16.8%
- 22 Which of the following projects must Starback Company choose based on its WACC and available retained earnings?
- 1 Projects A and C
 - 2 Projects C and D
 - 3 Projects A and D
 - 4 Projects A and B
- 23 If Starback Company follows a residual policy of dividends it will pay _____ in dividends
- 1 R 0
 - 2 R 42 000
 - 3 R 80 000
 - 4 R140 000
- 24 If Starback follows a residual theory of dividends its retention ratio will be equal to
- 1 33%
 - 2 41%
 - 3 53%
 - 4 82%
- 25 Naspers Ltd has to make an unavoidable capital investment of R1 000 000 this year. The firm's dividend policy requires that it pays 55% of its earnings attributable to ordinary shareholders (amounting to R800 000 this year) in the form of dividends. If Naspers maintains an optimal debt ratio of 40% which one of the following shows the correct weight of each form of financing in the calculation of the weighted average cost of capital (WACC)?
- 1 40% debt 36% retained earnings 24% new ordinary shares
 - 2 40% debt 60% retained earnings
 - 3 60% debt 32% retained earnings 8% new ordinary shares
 - 4 30% debt and 70% equity
- 26 A company plans to increase its earnings from R1 200 000 to R1 500 000 next year in response to an increase in EBIT from R1 701 640.85 to R2 124 176.06. The company's financial leverage is closest to
- 1 1.00
 - 2 1.25
 - 3 2.35
 - 4 4.10

[TURN OVER]

- 27 As the volume of financing increases the costs of the various types of financing will _____ the firm's weighted average cost of capital
- 1 increase lowering
 - 2 increase raising
 - 3 decrease lowering
 - 4 decrease raising
- 28 The cost of capital is the rate of return a firm must earn on its investments in projects in order to maintain market value of its _____
- 1 shares
 - 2 debts
 - 3 fixed assets
 - 4 total assets
- 29 The most commonly held view of capital structure according to the text is that the weighted average cost of capital _____
- 1 first falls with moderate levels of leverage and then increases
 - 2 decreases proportionately with decrease in leverage
 - 3 does not change with increase in leverage
 - 4 decreases indefinitely with increase in leverage
- 30 A firm uses financial leverage in order to _____
- 1 maximise dividend payout
 - 2 maximise the wealth of the owners
 - 3 keep in line with industry standards
 - 4 raise more funds

The following information refers to questions 31, 32, 33, 34 and 35:

Madiba Ltd has made the forecast of sales shown in the following table as well as associated probability of sales

Sales	Probability
R200 000	0.20
300 000	0.60
400 000	0.20

The company has fixed operating costs of R75 000 and variable operating costs equal to 70% of the sales level. It pays R12 000 interest per period. The tax rate is 28%. The company issued 10 000 ordinary shares.

[TURN OVER]

- 31 The earnings before interest and taxes (EBIT) for each level of sales are equal to
- 1 R56 000, R72 000, R93 000
 - 2 R85 000, R165 000, R245 000
 - 3 R89 000, R190 000, R255 000
 - 4 R93 000, R200 000, R275 000
- 32 The earnings per share (EPS) for each level of sales are equal to
- 1 3 151, 9 012, 14 130
 - 2 4 621, 10 120, 15 978
 - 3 5 256, 11 016, 16 776
 - 4 6 112, 12 014, 17 212
- 33 The **expected** earnings per share E(EPS) share for each level of sales are equal to
- 1 9 012
 - 2 11 017
 - 3 12 014
 - 4 17 212
- 34 The standard deviation of the earnings per share is closest to
- 1 3 641
 - 2 4 654
 - 3 5 321
 - 4 6 254
- 35 The coefficient of variation of the earning per share is closest to
- 1 0 850
 - 2 0 130
 - 3 0 230
 - 4 0 330
- 36 The problem with regular dividend policy from the business perspective is that
- 1 it bores the shareholders
 - 2 if the business earnings drop so does the dividend payment
 - 3 even when earnings are low the company must pay a fixed dividend
 - 4 it increases the shareholders' uncertainty
- 37 The repurchase of shares the earnings per share and the market price of shares
- 1 increases, increases
 - 2 decreases, decreases
 - 3 increases, decreases
 - 4 decrease, increases

[TURN OVER]

38 The type of lease in which the lessor acquires or purchases the asset in order to lease it to a given lessee is known as

- 1 a financial lease
- 2 a direct lease
- 3 an operating lease
- 4 a leveraged lease

39 The ability to use the sales and distribution channels to reach customers of both businesses is a benefit of

- 1 congeneric merger
- 2 conglomerate merger
- 3 horizontal merger
- 4 vertical merger

40 A combination of companies where the former company ceases to exist is a

- 1 congeneric formation
- 2 consolidation
- 3 merger
- 4 holding company

[TURN OVER]

QUESTION 2**(18 Marks)**

Europcar, a South African leading car rental company is attempting to determine whether to purchase or lease a fleet of Toyota Yaris for the rental purpose. The company is in the 28% tax bracket and its after-tax cost of debt is currently 7%.

Lease contract

Lease the fleet of Toyota Yaris for 3 years at a lease rental of R295 000 payable at the end of each year. All maintenance costs will be paid by the lessor. Insurance and other costs will be borne by the lessee.

Purchase option

Purchase the fleet of Toyota Yaris for R900 000 and finance it entirely with an 11% loan requiring annual end-of-year payment of R368 249 for three years. The fleet will be depreciated by R300 000 each year. The company will pay R5000 per year for a service contract that covers all maintenance costs. Insurance and other costs will be borne by Europcar.

REQUIRED

2.1 Prepare a loan amortisation schedule of Europcar by completing the following table (5)

Year	Loan payment	Interest @ 11%	Repayment of capital	Balance
1				
2				
3				

[TURN OVER]

- 2.2 Calculate the after-tax cash outflow of the lease contract by completing the following table (6)

Year	Lease Payment	Tax saving	After-tax cash outflow	PVIF@7%	PV of cash flow
1					
2					
3					

- 3.3 Calculate the after-tax cash outflow the borrow-and –buy option by completing the following table (6)

Year	Loan payment	Maintenance	Interest	Depreciation	Total deduction	PVIF@ 7%	PV of cash flow
1							
2							
3							

[TURN OVER]

2.4 Which alternative lease or purchase would you recommend? Justify your answer (1)

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Interest tables

Table 1

Future-Value Interest Factors for R1 compounded at k percent for n Periods

$$FVIF_{kn} = (1 + k)^n$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%	35%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130	1.140	1.150	1.160	1.200	1.250	1.300	1.350
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277	1.300	1.323	1.346	1.440	1.563	1.690	1.823
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443	1.482	1.521	1.561	1.728	1.953	2.197	2.460
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630	1.689	1.749	1.811	2.074	2.441	2.856	3.322
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842	1.925	2.011	2.100	2.468	3.052	3.713	4.484
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082	2.195	2.313	2.436	2.986	3.815	4.827	6.053
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353	2.502	2.660	2.826	3.583	4.768	6.275	8.172
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658	2.853	3.059	3.278	4.300	5.960	8.157	11.03
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004	3.252	3.518	3.803	5.160	7.451	10.60	14.89
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395	3.707	4.046	4.411	6.192	9.313	13.79	20.11
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836	4.226	4.652	5.117	7.430	11.64	17.92	27.14
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.335	4.818	5.350	5.936	8.916	14.55	23.30	36.64
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898	5.492	6.153	6.886	10.70	18.19	30.29	49.47
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.867	5.535	6.261	7.076	7.988	12.84	22.74	39.37	66.78
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254	7.138	8.137	9.266	15.41	28.42	51.19	90.16
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067	8.137	9.358	10.75	18.49	35.53	66.54	121.7
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986	9.276	10.76	12.47	22.19	44.41	86.50	164.3
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.544	7.690	9.024	10.58	12.38	14.46	26.62	55.51	112.5	221.8
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263	8.613	10.20	12.06	14.23	16.78	31.95	69.39	146.2	299.5
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727	8.062	9.646	11.52	13.74	16.37	19.46	38.34	86.74	190.0	404.3
21	1.232	1.516	1.860	2.279	2.786	3.400	4.141	5.034	6.109	7.400	8.949	10.80	13.02	15.67	18.82	22.57	46.01	108.4	247.1	545.8
22	1.245	1.546	1.916	2.370	2.925	3.604	4.430	5.437	6.659	8.140	9.934	12.10	14.71	17.86	21.64	26.19	55.21	135.5	321.2	736.8
23	1.257	1.577	1.974	2.465	3.072	3.820	4.741	5.871	7.258	8.954	11.03	13.55	16.63	20.36	24.89	30.38	66.25	169.4	417.5	994.7
24	1.270	1.608	2.033	2.563	3.225	4.049	5.072	6.341	7.911	9.850	12.24	15.18	18.79	23.21	28.63	35.24	79.50	211.8	542.8	1343
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.83	13.59	17.00	21.23	26.46	32.92	40.87	95.40	264.7	705.6	1813
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.06	13.27	17.45	22.89	29.96	39.12	50.95	66.21	85.85	237.4	607.8	2620	8129
35	1.417	2.000	2.814	3.946	5.516	7.686	10.68	14.79	20.41	28.10	38.57	52.80	72.07	98.10	133.2	180.3	590.7	2465	9728	36449
40	1.489	2.208	3.262	4.801	7.040	10.29	14.97	21.72	31.41	45.26	65.00	93.05	132.8	188.9	267.9	378.7	1470	7523	36119	
45	1.565	2.438	3.782	5.841	8.985	13.76	21.00	31.92	48.33	72.89	109.5	164.0	244.6	363.7	538.8	795.4	3657	22959		
50	1.645	2.692	4.384	7.107	11.47	18.42	29.46	46.90	74.36	117.4	184.6	289.0	450.7	700.2	1084	1671	9100	70065		

* FVIF > 99999

Table 2

Future-Value Interest Factors for a R1 annuity compounded at k percent for n Periods

$$FVIFA_{k,n} = \sum_{t=1}^n (1+k)^{t-1}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%	35%
1	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
2	2 010	2 020	2 030	2 040	2 050	2 060	2 070	2 080	2 090	2 100	2 110	2 120	2 130	2 140	2 150	2 160	2 200	2 250	2 300	2 350
3	3 030	3 060	3 091	3 122	3 153	3 184	3 215	3 246	3 278	3 310	3 342	3 374	3 407	3 440	3 473	3 506	3 640	3 813	3 990	4 173
4	4 060	4 122	4 184	4 246	4 310	4 375	4 440	4 506	4 573	4 641	4 710	4 779	4 850	4 921	4 993	5 066	5 368	5 766	6 187	6 633
5	5 101	5 204	5 309	5 416	5 526	5 637	5 751	5 867	5 985	6 105	6 228	6 353	6 480	6 610	6 742	6 877	7 442	8 207	9 043	9 954
6	6 152	6 308	6 468	6 633	6 802	6 975	7 153	7 336	7 523	7 716	7 913	8 115	8 323	8 536	8 754	8 977	9 930	11 259	12 756	14 438
7	7 214	7 434	7 662	7 898	8 142	8 394	8 654	8 923	9 200	9 487	9 783	10 089	10 405	10 730	11 067	11 414	12 916	15 073	17 583	20 492
8	8 286	8 583	8 892	9 214	9 549	9 897	10 26	10 64	11 03	11 44	11 86	12 30	12 76	13 23	13 73	14 24	16 50	19 84	23 86	28 66
9	9 369	9 755	10 16	10 58	11 03	11 49	11 98	12 49	13 02	13 58	14 16	14 78	15 42	16 09	16 79	17 52	20 80	25 80	32 01	39 70
10	10 46	10 95	11 46	12 01	12 58	13 18	13 82	14 49	15 19	15 94	16 72	17 55	18 42	19 34	20 30	21 32	25 96	33 25	42 62	54 59
11	11 57	12 17	12 81	13 49	14 21	14 97	15 78	16 65	17 56	18 53	19 56	20 65	21 81	23 04	24 35	25 73	32 15	42 57	56 41	74 70
12	12 68	13 41	14 19	15 03	15 92	16 87	17 89	18 98	20 14	21 38	22 71	24 13	25 65	27 27	29 00	30 85	39 58	54 21	74 33	101 8
13	13 81	14 68	15 62	16 63	17 71	18 88	20 14	21 50	22 95	24 52	26 21	28 03	29 98	32 09	34 35	36 79	48 50	68 76	97 63	138 5
14	14 95	15 97	17 09	18 29	19 60	21 02	22 55	24 21	26 02	27 97	30 09	32 39	34 88	37 58	40 50	43 67	59 20	86 95	127 9	188 0
15	16 10	17 29	18 60	20 02	21 58	23 28	25 13	27 15	29 36	31 77	34 41	37 28	40 42	43 84	47 58	51 66	72 04	109 7	167 3	254 7
16	17 26	18 64	20 16	21 82	23 66	25 67	27 89	30 32	33 00	35 95	39 19	42 75	46 67	50 98	55 72	60 93	87 44	138 1	218 5	344 9
17	18 43	20 01	21 76	23 70	25 84	28 21	30 84	33 75	36 97	40 54	44 50	48 88	53 74	59 12	65 08	71 67	105 9	173 6	285 0	466 6
18	19 61	21 41	23 41	25 65	28 13	30 91	34 00	37 45	41 30	45 60	50 40	55 75	61 73	68 39	75 84	84 14	128 1	218 0	371 5	630 9
19	20 81	22 84	25 12	27 67	30 54	33 76	37 38	41 45	46 02	51 16	56 94	63 44	70 75	78 97	88 21	98 60	154 7	273 6	484 0	852 7
20	22 02	24 30	26 87	29 78	33 07	36 79	41 00	45 76	51 16	57 27	64 20	72 05	80 95	91 02	102 4	115 4	186 7	342 9	630 2	1152
21	23 24	25 78	28 68	31 97	35 72	39 99	44 87	50 42	56 76	64 00	72 27	81 70	92 47	104 8	118 8	134 8	225 0	429 7	820 2	1556
22	24 47	27 30	30 54	34 25	38 51	43 39	49 01	55 46	62 87	71 40	81 21	92 50	105 5	120 4	137 6	157 4	271 0	538 1	1067	2102
23	25 72	28 84	32 45	36 62	41 43	47 00	53 44	60 89	69 53	79 54	91 15	104 6	120 2	138 3	159 3	183 6	326 2	673 6	1388	2839
24	26 97	30 42	34 43	39 08	44 50	50 82	58 18	66 76	76 79	88 50	102 2	118 2	136 8	158 7	184 2	214 0	392 5	843 0	1806	3834
25	28 24	32 03	36 46	41 65	47 73	54 86	63 25	73 11	84 70	98 35	114 4	133 3	155 6	181 9	212 8	249 2	472 0	1055	2349	5177
30	34 78	40 57	47 58	56 08	66 44	79 06	94 46	113 3	136 3	164 5	199 0	241 3	293 2	356 8	434 7	530 3	1182	3227	8730	23222
35	41 66	49 99	60 46	73 65	90 32	111 4	138 2	172 3	215 7	271 0	341 6	431 7	546 7	693 6	881 2	1121	2948	9857	32423	
40	48 89	60 40	75 40	95 03	120 8	154 8	199 6	259 1	337 9	442 6	581 8	767 1	1014	1342	1779	2361	7344	30089	*	
45	56 48	71 89	92 72	121 0	159 7	212 7	285 7	386 5	525 9	718 9	986 6	1358	1874	2591	3585	4965	18281	91831		
50	64 46	84 58	112 8	152 7	209 3	290 3	406 5	573 8	815 1	1164	1669	2400	3460	4995	7218	10436	45497		*	

* FVIFA > 99999

Table 3

Present-Value Interest Factors for R1 Discounted at k percent for n Periods

$$PVIF_{kn} = \frac{1}{(1+k)^n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%	35%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870	0.862	0.833	0.800	0.769	0.741
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783	0.769	0.756	0.743	0.694	0.640	0.592	0.549
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693	0.675	0.658	0.641	0.579	0.512	0.455	0.406
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613	0.592	0.572	0.552	0.482	0.410	0.350	0.301
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543	0.519	0.497	0.476	0.402	0.328	0.269	0.223
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480	0.456	0.432	0.410	0.335	0.262	0.207	0.165
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425	0.400	0.376	0.354	0.279	0.210	0.159	0.122
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376	0.351	0.327	0.305	0.233	0.168	0.123	0.091
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361	0.333	0.308	0.284	0.263	0.194	0.134	0.094	0.067
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295	0.270	0.247	0.227	0.162	0.107	0.073	0.050
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287	0.261	0.237	0.215	0.195	0.135	0.086	0.056	0.037
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231	0.208	0.187	0.168	0.112	0.069	0.043	0.027
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229	0.204	0.182	0.163	0.145	0.093	0.055	0.033	0.020
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205	0.181	0.160	0.141	0.125	0.078	0.044	0.025	0.015
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.160	0.140	0.123	0.108	0.065	0.035	0.020	0.011
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141	0.123	0.107	0.093	0.054	0.028	0.015	0.008
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146	0.125	0.108	0.093	0.080	0.045	0.023	0.012	0.006
18	0.836	0.700	0.587	0.494	0.415	0.350	0.296	0.250	0.212	0.180	0.153	0.130	0.111	0.095	0.081	0.069	0.038	0.018	0.009	0.005
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116	0.098	0.083	0.070	0.060	0.031	0.014	0.007	0.003
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087	0.073	0.061	0.051	0.026	0.012	0.005	0.002
21	0.811	0.660	0.538	0.439	0.359	0.294	0.242	0.199	0.164	0.135	0.112	0.093	0.077	0.064	0.053	0.044	0.022	0.009	0.004	0.002
22	0.803	0.647	0.522	0.422	0.342	0.278	0.226	0.184	0.150	0.123	0.101	0.083	0.068	0.056	0.046	0.038	0.018	0.007	0.003	0.001
23	0.795	0.634	0.507	0.406	0.326	0.262	0.211	0.170	0.138	0.112	0.091	0.074	0.060	0.049	0.040	0.033	0.015	0.006	0.002	0.001
24	0.788	0.622	0.492	0.390	0.310	0.247	0.197	0.158	0.126	0.102	0.082	0.066	0.053	0.043	0.035	0.028	0.013	0.005	0.002	0.001
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059	0.047	0.038	0.030	0.024	0.010	0.004	0.001	0.001
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033	0.026	0.020	0.015	0.012	0.004	0.001		
35	0.706	0.500	0.355	0.253	0.181	0.130	0.094	0.068	0.049	0.036	0.026	0.019	0.014	0.010	0.008	0.006	0.002			
40	0.672	0.453	0.307	0.208	0.142	0.097	0.067	0.046	0.032	0.022	0.015	0.011	0.008	0.005	0.004	0.003	0.001			
45	0.639	0.410	0.264	0.171	0.111	0.073	0.048	0.031	0.021	0.014	0.009	0.006	0.004	0.003	0.002	0.001	0.000	*	*	*
50	0.608	0.372	0.228	0.141	0.087	0.054	0.034	0.021	0.013	0.009	0.005	0.003	0.002	0.001	0.001	0.001				*

* PVIF = 000 when rounded to three decimal places

Table 4
Present-Value Interest Factors for a R1 annuity discounted at k percent for n Periods

$$PVIFA_{kn} = \sum_{i=1}^n \frac{1}{(1+k)^i}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%	35%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870	0.862	0.833	0.800	0.769	0.741
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668	1.647	1.626	1.605	1.528	1.440	1.361	1.289
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361	2.322	2.283	2.246	2.106	1.952	1.816	1.696
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974	2.914	2.855	2.798	2.589	2.362	2.166	1.997
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517	3.433	3.352	3.274	2.991	2.689	2.436	2.220
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111	3.998	3.889	3.784	3.685	3.326	2.951	2.643	2.385
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564	4.423	4.288	4.160	4.039	3.605	3.161	2.802	2.508
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799	4.639	4.487	4.344	3.837	3.329	2.925	2.598
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132	4.946	4.772	4.607	4.031	3.463	3.019	2.665
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426	5.216	5.019	4.833	4.192	3.571	3.092	2.715
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687	5.453	5.234	5.029	4.327	3.656	3.147	2.752
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918	5.660	5.421	5.197	4.439	3.725	3.190	2.779
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424	6.122	5.842	5.583	5.342	4.533	3.780	3.223	2.799
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302	6.002	5.724	5.468	4.611	3.824	3.249	2.814
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	7.191	6.811	6.462	6.142	5.847	5.575	4.675	3.859	3.268	2.825
16	14.72	13.58	12.56	11.65	10.84	10.11	9.447	8.851	8.313	7.824	7.379	6.974	6.604	6.265	5.954	5.668	4.730	3.887	3.283	2.834
17	15.56	14.29	13.17	12.17	11.27	10.48	9.763	9.122	8.544	8.022	7.549	7.120	6.729	6.373	6.047	5.749	4.775	3.910	3.295	2.840
18	16.40	14.99	13.75	12.66	11.69	10.83	10.06	9.372	8.756	8.201	7.702	7.250	6.840	6.467	6.128	5.818	4.812	3.928	3.304	2.844
19	17.23	15.68	14.32	13.13	12.09	11.16	10.34	9.604	8.950	8.365	7.839	7.366	6.938	6.550	6.198	5.877	4.843	3.942	3.311	2.848
20	18.05	16.35	14.88	13.59	12.46	11.47	10.59	9.818	9.129	8.514	7.963	7.469	7.025	6.623	6.259	5.929	4.870	3.954	3.316	2.850
21	18.86	17.01	15.42	14.03	12.82	11.76	10.84	10.02	9.292	8.649	8.075	7.562	7.102	6.687	6.312	5.973	4.891	3.963	3.320	2.852
22	19.66	17.66	15.94	14.45	13.16	12.04	11.06	10.20	9.442	8.772	8.176	7.645	7.170	6.743	6.359	6.011	4.909	3.970	3.323	2.853
23	20.46	18.29	16.44	14.86	13.49	12.30	11.27	10.37	9.580	8.883	8.266	7.718	7.230	6.792	6.399	6.044	4.925	3.976	3.325	2.854
24	21.24	18.91	16.94	15.25	13.80	12.55	11.47	10.53	9.707	8.985	8.348	7.784	7.283	6.835	6.434	6.073	4.937	3.981	3.327	2.855
25	22.02	19.52	17.41	15.62	14.09	12.78	11.65	10.67	9.823	9.077	8.422	7.843	7.330	6.873	6.464	6.097	4.948	3.985	3.329	2.856
30	25.81	22.40	19.60	17.29	15.37	13.76	12.41	11.26	10.27	9.427	8.694	8.055	7.496	7.003	6.566	6.177	4.979	3.995	3.332	2.857
35	29.41	25.00	21.49	18.66	16.37	14.50	12.95	11.65	10.57	9.644	8.855	8.176	7.586	7.070	6.617	6.215	4.992	3.998	3.333	2.857
40	32.83	27.36	23.11	19.79	17.16	15.05	13.33	11.92	10.76	9.779	8.951	8.244	7.634	7.105	6.642	6.233	4.997	3.999	3.333	2.857
45	36.09	29.49	24.52	20.72	17.77	15.46	13.61	12.11	10.88	9.863	9.008	8.283	7.661	7.123	6.654	6.242	4.999	4.000	3.333	2.857
50	39.20	31.42	25.73	21.48	18.26	15.76	13.80	12.23	10.96	9.915	9.042	8.304	7.675	7.133	6.661	6.246	4.999	4.000	3.333	2.857

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- ② The paper number pertains only to first-level courses consisting of two papers

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0	1
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 for the first paper and

0	2
---	---

 for the second. If only one paper, then leave blank

- ③ Fill in your initials and surname

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