# ZCAS University

BAC3302 FINANCIAL MANAGEMENT

MID SEMESTER TEST

THURSDAY 19 OCTOBER 2023

12:30-15:30

## INSTRUCTIONS:

TIME ALLOWED: READING AND WRITING – THREE HOURS – 5 MINUTES

1. Section A: This question is compulsory and must be attempted.

2. Sections B: Answer THREE (3) questions from this section.

3. This examination paper carries a total of 100 marks.

4. FORMULAE SHEET and PRESENT VALUE TABLES are included.

# SECTION A: QUESTION 1 COMPULSORY AND MUST BE ATTEMPTED

## QUESTION 1

Dahlia Co is considering acquisition of a new machine costing K1,500,000 to be used in the production of Vitamin Q a food supplement. The investment is expected to run for four years at the end of which the equipment will be sold at a scrap value of K100,000. Annual demand of Vitamin Q over the 4-year period is expected to be as follows:

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Demand (units) | 45,000 | 70,000 | 80,000 | 60,000 |
| Selling price per unit K | 26 | 27 | 28 | 29 |
| Variable cost per unit K | 11 | 13 | 15 | 17 |
| Fixed cost per year K | `105,000 | 115,000 | 125,000 | 125,000 |
| Working capital per year K | 117,000 | 189,000 | 224,000 | 174,000 |

Capital allowances can be claimed at 25% per year on a reducing balance basis with balancing allowance or charge considered in the final year. Dahlia pays tax at 30% per year one year in areas. For investment appraisal purposes, the firm uses an after-tax cost of capital of 16% per year with a target basic payback period of exactly 2 years.

## REQUIRED:

(a) Calculate the net present value (NPV) of the investment and comment on the results.   [25 marks]

(b) Calculate the basic payback period of the project and comment on the results.          [6marks]

(c) Briefly discuss the advantages of the net present value (NPV) method over the basic payback period.          [6 marks]

(d) Briefly explain why the following elements are excluded from cash flows in project appraisal.

    i.    Apportioned fixed cost.

    ii.   Interest on debt used to finance the project.          [3 marks]

[Total 40 marks]

**SECTION B: ATTEMPT ANY THREE QUESTIONS IN THIS SECTION.**

**QUESTION 2**

The following is the capital structure of Bupilo plc a stock market listed company.

|  | K |
|---|---|
| Ordinary share capital (K0.75) | 60,000,000 |
| Share premium | 30,000,000 |
| 10% K100 redeemable bonds | 20,000,000 |
| 9% Bank loan | 40,000,000 |
| **Total capital employed** | **150,000,000** |

The ordinary shares are trading at K1.20 ex-div per share while the bonds are quoted at K97.0 ex-int per K100 nominal. The firm pays tax at 25% per year. The company is expected to pay dividend of 6n per share at the end of the year. Once paid dividend growth will be constant at 10% per year.

**REQUIRED:**

(a)     Calculate the weighted average cost of capital using market value weights.   [15 marks]

(b)     Briefly discuss the advantages of a company being listed on the stock market. [5 marks]

[Total: 20 marks]

**QUESTION 3**

The CEO of ERS Co uses the Miller-Orr model in managing its liquidity position. Due to the nature of the firms' operations, the lower limit of cash per day is K15,000 while the standard deviation is K4,000 (Variance of K16,000,000). The transaction cost is K200 per transaction while the interest rate is 10.95% per year or 0.03% per day.

**REQUIRED:**

a)  Calculate the spread, the upper limit, and the return point of the cash balances.  [8 marks]

b)  With the aid of a diagram, discuss the relevance of the figures in (a) above.       [9 marks]

c)   Briefly discuss the importance of managing cash when running a business.       [3 marks]

    [Total 20 marks]

## QUESTION 4

Dustin Co is a business that provides executive car hire services. The company services and cleans its fleet of cars regularly to maintain a first-class service for its clients. Each vehicle cost approximately K150,000 to buy while the servicing and cleaning costs per year are as follows:

| Year | 1 | 2 | 3 |
|------|-----|-----|-----|
| Servicing cost | K10,000 | K14,000 | K19,000 |
| Cleaning cost | K4,000 | K6,000 | K7,500 |

The directors of the firm are considering whether to replace its fleet of vehicles every after 2 years or 3 years for reliability reasons. The resale values are expected to be K90,000 end of year 2 and K70,000 end of year 3. The company's cost of capital is 10%.

## REQUIRED:

a) Calculate the equivalent annual cost (EAC) for BOTH proposed replacement cycles and recommend the best replacement period. Give reasons for your option.                [14 marks]

b) Briefly discuss possible ways of incorporate inflation in project appraisal.                [6 marks]

[Total 20 marks]

## QUESTION 5

The ZCAS University Student Union (ZCASUU) is holding a finance awareness week aimed at sharing knowledge to its members. You have been invited to address various issues in finance in line with the questions below.

## REQUIRED:

a) Briefly explain the difference between financial intermediation and disintermediation and highlight the main functions of intermediaries.                [10 marks]

b) Briefly interpret the credit term "1.8 / 15 net 80" and calculate the annual cost of giving an early settlement discount. Comment on the results assuming the cost of working capital finance is 12% per year.        [10 marks]                [Total:20 marks]

**END OF TEST**

**FORMULAE SHEET**

1. $EAC = \dfrac{NPV \text{ of Costs}}{\text{Annuity factor of the cycle}}$

2. $IRR (YTM) = A + \left[\dfrac{a}{a-b} \; x \; (B-A)\right]$

3. $Spread = 3 \; x \; \sqrt[3]{\left[\dfrac{0.75 \; x \; Variance \; of \; cashflow \; x \; Transaction \; cost}{Interest \; per \; day}\right]}$

4. $EOQ = \sqrt{\left(\dfrac{2 \cdot D \cdot C}{h}\right)}$

5. $EOQ \; (Q) = \sqrt{\left(\dfrac{2 \cdot F \cdot S}{i}\right)}$

6. $CAPM:\; r_i = r_f + \beta_i \{r_m - r_f\}$

7. $\cdot g = \sqrt[n]{\left(\dfrac{Latest \; dividend}{Earliest \; dividend}\right)} - 1$

8. $WACC = re\left(\dfrac{Ve}{Ve+Vd}\right) + rd(1-t)\left(\dfrac{Ve}{Ve+Vd}\right)$

9. $Annual \; cost = \left(\dfrac{100}{100-d}\right)^{\left(\frac{365}{t}\right)} - 1$

10. $K_d \; (r_d) = \dfrac{I \; (1-tax) \; x \; 100}{P_0}$

11. $K_e = \dfrac{do \; (1+g)}{P_0} + g$

# PRESENT VALUE TABLE

Present value of 1, i.e. $(1 + r)^{-n}$  Where  r = discount rate

n = number of periods until payment

| Periods (n) | Discount rate (r) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 |
| 2 | 0.980 | 0.961 | 0.943 | 0.925 | 0.907 | 0.890 | 0.873 | 0.857 | 0.842 | 0.826 |
| 3 | 0.971 | 0.942 | 0.915 | 0.889 | 0.864 | 0.840 | 0.816 | 0.794 | 0.772 | 0.751 |
| 4 | 0.961 | 0.924 | 0.888 | 0.855 | 0.823 | 0.792 | 0.763 | 0.735 | 0.708 | 0.683 |
| 5 | 0.951 | 0.906 | 0.863 | 0.822 | 0.784 | 0.747 | 0.713 | 0.681 | 0.650 | 0.621 |
| 6 | 0.942 | 0.888 | 0.837 | 0.790 | 0.746 | 0.705 | 0.666 | 0.630 | 0.596 | 0.564 |
| 7 | 0.933 | 0.871 | 0.813 | 0.760 | 0.711 | 0.665 | 0.623 | 0.583 | 0.547 | 0.513 |
| 8 | 0.923 | 0.853 | 0.789 | 0.731 | 0.677 | 0.627 | 0.582 | 0.540 | 0.502 | 0.467 |
| 9 | 0.914 | 0.837 | 0.766 | 0.703 | 0.645 | 0.592 | 0.544 | 0.500 | 0.460 | 0.424 |
| 10 | 0.905 | 0.820 | 0.744 | 0.676 | 0.614 | 0.558 | 0.508 | 0.463 | 0.422 | 0.386 |
| 12 | 0.887 | 0.788 | 0.701 | 0.625 | 0.557 | 0.497 | 0.444 | 0.397 | 0.356 | 0.319 |
| 13 | 0.879 | 0.773 | 0.681 | 0.601 | 0.530 | 0.469 | 0.415 | 0.368 | 0.326 | 0.290 |
| 14 | 0.870 | 0.758 | 0.661 | 0.577 | 0.505 | 0.442 | 0.388 | 0.340 | 0.299 | 0.263 |
| 15 | 0.861 | 0.743 | 0.642 | 0.555 | 0.481 | 0.417 | 0.362 | 0.315 | 0.275 | 0.239 |

| Periods (n) | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 |
| 2 | 0.812 | 0.797 | 0.783 | 0.769 | 0.756 | 0.743 | 0.731 | 0.718 | 0.706 | 0.694 |
| 3 | 0.731 | 0.712 | 0.693 | 0.675 | 0.658 | 0.641 | 0.624 | 0.609 | 0.593 | 0.579 |
| 4 | 0.659 | 0.636 | 0.613 | 0.592 | 0.572 | 0.552 | 0.534 | 0.516 | 0.499 | 0.482 |
| 5 | 0.593 | 0.567 | 0.543 | 0.519 | 0.497 | 0.476 | 0.456 | 0.437 | 0.419 | 0.402 |
| 6 | 0.535 | 0.507 | 0.480 | 0.456 | 0.432 | 0.410 | 0.390 | 0.370 | 0.352 | 0.335 |
| 7 | 0.482 | 0.452 | 0.425 | 0.400 | 0.376 | 0.354 | 0.333 | 0.314 | 0.296 | 0.279 |
| 8 | 0.434 | 0.404 | 0.376 | 0.351 | 0.327 | 0.305 | 0.285 | 0.266 | 0.249 | 0.233 |
| 9 | 0.391 | 0.361 | 0.333 | 0.308 | 0.284 | 0.263 | 0.243 | 0.225 | 0.209 | 0.194 |
| 11 | 0.317 | 0.287 | 0.261 | 0.237 | 0.215 | 0.195 | 0.178 | 0.162 | 0.148 | 0.135 |
| 12 | 0.286 | 0.257 | 0.231 | 0.208 | 0.187 | 0.168 | 0.152 | 0.137 | 0.124 | 0.112 |
| 13 | 0.258 | 0.229 | 0.204 | 0.182 | 0.163 | 0.145 | 0.130 | 0.116 | 0.104 | 0.093 |
| 14 | 0.232 | 0.205 | 0.181 | 0.160 | 0.141 | 0.125 | 0.111 | 0.099 | 0.088 | 0.078 |
| 15 | 0.209 | 0.183 | 0.160 | 0.140 | 0.123 | 0.108 | 0.095 | 0.084 | 0.074 | 0.065 |

# ANNUITY TABLE

Present value of an annuity of 1, i.e.

$$\frac{1-(1+r)^{-n}}{r}$$

Where r = discount rate      n = number of periods until payment

| Periods (n) | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 |
| 2 | 1.970 | 1.942 | 1.913 | 1.886 | 1.859 | 1.833 | 1.808 | 1.783 | 1.759 | 1.736 |
| 3 | 2.941 | 2.884 | 2.829 | 2.775 | 2.723 | 2.673 | 2.624 | 2.577 | 2.531 | 2.487 |
| 4 | 3.902 | 3.808 | 3.717 | 3.630 | 3.546 | 3.465 | 3.387 | 3.312 | 3.240 | 3.170 |
| 5 | 4.853 | 4.713 | 4.580 | 4.452 | 4.329 | 4.212 | 4.100 | 3.993 | 3.890 | 3.791 |
| 6 | 5.795 | 5.601 | 5.417 | 5.242 | 5.076 | 4.917 | 4.767 | 4.623 | 4.486 | 4.355 |
| 7 | 6.728 | 6.472 | 6.230 | 6.002 | 5.786 | 5.582 | 5.389 | 5.206 | 5.033 | 4.868 |
| 8 | 7.652 | 7.325 | 7.020 | 6.733 | 6.463 | 6.210 | 5.971 | 5.747 | 5.535 | 5.335 |
| 9 | 8.566 | 8.162 | 7.786 | 7.435 | 7.108 | 6.802 | 6.515 | 6.247 | 5.995 | 5.759 |
| 11 | 10.368 | 9.787 | 9.253 | 8.760 | 8.306 | 7.887 | 7.499 | 7.139 | 6.805 | 8.495 |
| 12 | 11.255 | 10.575 | 9.954 | 9.385 | 8.863 | 8.384 | 7.943 | 7.536 | 7.161 | 6.814 |
| 13 | 12.134 | 11.348 | 10.635 | 9.986 | 9.394 | 8.853 | 8.358 | 7.904 | 7.487 | 7.103 |
| 14 | 13.004 | 12.106 | 11.296 | 10.563 | 9.899 | 9.295 | 8.745 | 8.244 | 7.786 | 7.367 |
| 15 | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.712 | 9.108 | 8.559 | 8.061 | 7.606 |

| Periods (n) | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 |
| 2 | 1.713 | 1.690 | 1.668 | 1.647 | 1.626 | 1.605 | 1.585 | 1.566 | 1.547 | 1.528 |
| 3 | 2.444 | 2.402 | 2.361 | 2.322 | 2.283 | 2.246 | 2.210 | 2.174 | 2.140 | 2.106 |
| 4 | 3.102 | 3.037 | 2.974 | 2.914 | 2.855 | 2.798 | 2.743 | 2.690 | 2.639 | 2.589 |
| 5 | 3·696 | 3.605 | 3.517 | 3.433 | 3.352 | 3.274 | 3.199 | 3.127 | 3.058 | 2.991 |
| 6 | 4.231 | 4.111 | 3.998 | 3.889 | 3.784 | 3.685 | 3.589 | 3.498 | 3.410 | 3.326 |
| 7 | 4.712 | 4.564 | 4.423 | 4.288 | 4.160 | 4.039 | 3.922 | 3.812 | 3.706 | 3.605 |
| 8 | 5.146 | 4.968 | 4.799 | 4.639 | 4.487 | 4.344 | 4.207 | 4.078 | 3.954 | 3.837 |
| 9 | 5.537 | 5.328 | 5.132 | 4.946 | 4.772 | 4.607 | 4.451 | 4.303 | 4.163 | 4.031 |
| 10 | 5.889 | 5.650 | 5.426 | 5.216 | 5.019 | 4.833 | 4.659 | 4.494 | 4.339 | 4.192 |
| 12 | 6.492 | 6.194 | 5.918 | 5.660 | 5.421 | 5.197 | 4.968 | 4.793 | 4.611 | 4.439 |
| 13 | 6.750 | 6.424 | 6.122 | 5.842 | 5.583 | 5.342 | 5.118 | 4.910 | 4.715 | 4.533 |
| 14 | 6.982 | 6.628 | 6.302 | 6.002 | 5.724 | 5.468 | 5.229 | 5.008 | 4.802 | 4.611 |
| 15 | 7.191 | 6.811 | 6.462 | 6.142 | 5.847 | 5.575 | 5.324 | 5.092 | 4.876 | 4.675 |