Financial Management | Mock Exam 4

Focus: Comprehensive — Ch 2 CFFA | Ch 3 DuPont/Growth | Ch 4 TVM | Ch 5 Bond Pricing

Name: _____ Student ID: _____ Date: _____

T/F: 12pt | Short Answer: 45pt | Essay: 18pt | Total: 75pt | Time: 90 min

Part A: True or False (1pt each × 12 = 12pt) [12pts]

Indicate True (T) or False (F) in the bracket.

1. [T / F] The agency problem arises from the separation of ownership and management in corporations.

2. [T / F] If a firm's ending net fixed assets equal its beginning net fixed assets, then net capital spending equals zero.

3. [T / F] A decrease in accounts receivable represents a source of cash.

4. [T / F] The cash coverage ratio is calculated as EBITDA divided by interest expense.

5. [T / F] A firm with total debt ratio of 0.40 has a debt-equity ratio of 0.40.

6. [T / F] Increasing the dividend payout ratio will increase the sustainable growth rate, all else equal.

7. [T / F] The time value of money concept states that a dollar received today is worth more than a dollar received in the future.

8. [T / F] If you double the number of compounding periods per year, you more than double the EAR.

9. [T / F] The present value of a growing perpetuity with cash flow C, growth rate g, and discount rate r is C/(r-g), assuming r > g.

10. [T / F] If you delay investing for one year, you need to invest more money today to reach the same future value target.

11. [T / F] A bond's dirty price equals its clean price plus accrued interest since the last coupon payment.

12. [T / F] A lower coupon rate on a bond, holding all else equal, leads to lower interest rate risk.

Part B: Short Answer / Calculation (3pt each × 15 = 45pt) [45pts]

Show all work for full credit.

1. **(3pt)** Crescent Corp. reports: Sales $1,200,000; COGS $650,000; SG&A $140,000; Dep $88,000; Interest $35,000; Tax 21%; Dividends $90,000. Calculate: (a) Net income, (b) EPS if shares = 100,000, (c) addition to retained earnings.

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2. **(3pt)** Sunrise Inc. beginning-of-year balance sheet: CA=$520,000, NFA=$1,900,000, CL=$280,000, LTD=$900,000, equity=$1,240,000. End of year: CA=$580,000, NFA=$1,780,000, CL=$310,000. Dep=$200,000. Calculate: (a) ΔNWC, (b) NCS.

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3. **(3pt)** Using data from Q2, if OCF was $480,000, what is CFFA? Also compute CF to Creditors if net new borrowing was -$50,000 (debt paid down) and interest paid was $72,000.

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4. **(3pt)** Everest Co. has: CA=$950,000, NFA=$3,400,000, CL=$420,000, LTD=$1,680,000. EBIT=$620,000, Dep=$180,000, Interest=$95,000. Tax=21%. Calculate: (a) TIE, (b) cash coverage ratio, (c) total debt ratio.

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5. **(3pt)** Westco has: Sales=$3,600,000; NI=$216,000; TA=$3,000,000; TE=$1,200,000; Dividends=$64,800. Calculate: (a) PM, (b) AT, (c) EM, (d) ROE via DuPont, (e) sustainable growth rate.

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6. **(3pt)** Your car costs $35,000 today. Prices rise 3.5% per year. (a) What will the same car cost in 6 years? (b) If you invest $20,000 today at 5% annually, will you have enough in 6 years? By how much will you be short or over?

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7. **(3pt)** You need $200,000 for a house down payment in 8 years. (a) If you earn 6% annually, how much must you invest today (lump sum)? (b) How much must you save per year (ordinary annuity) to reach this goal?

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8. **(3pt)** A bank quotes 8.4% APR compounded daily. (a) What is the EAR? (b) What is the EAR if instead it compounds continuously at 8.4%?

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9. **(3pt)** You are to receive cash flows of: $3,000 at year 1, $5,000 at year 2, $8,000 at year 3, $6,000 at year 4. Discount rate is 7%. What is the total present value of these cash flows?

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10. **(3pt)** An annuity pays $4,500 per year for 18 years. (a) If the interest rate is 6%, what is the PV today? (b) What would the PV be if it were a perpetuity instead?

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11. **(3pt)** You borrowed $180,000 at 5.1% APR (monthly compounding) for 30 years. (a) Calculate your monthly payment. (b) How much interest do you pay in month 1? (c) What is your remaining balance after month 1?

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12. (3pt) A bond has face value $1,000, coupon rate 9% semiannual, 6 years to maturity, YTM 8%. (a) Discount or premium? (b) Calculate bond price. (c) If YTM rises to 9.5%, what is the new price?

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13. (3pt) Wheeler's bonds: 13-year maturity, YTM 7.6%, current price $901.98, semiannual payments, face $1,000. (a) What is the coupon rate? (b) Is this a discount or premium bond?

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14. (3pt) A semiannual bond pays coupons on March 1 and September 1. Coupon rate is 8%, face value $1,000. Today is June 1. (a) How many months of accrued interest? (b) Calculate accrued interest. (c) If clean price is $1,050, what is the dirty (invoice) price?

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15. (3pt) Bond A: 5% coupon, 10 years TTM. Bond B: 5% coupon, 25 years TTM. Both have face=$1,000 and current YTM=5% (both at par). If YTM rises to 6%: (a) Calculate new price of Bond A. (b) Calculate new price of Bond B. (c) Which dropped more in percentage terms, and why?

Part C: Essay / Descriptive (6pt each × 3 = 18pt) [18pts]

1. (6pt) Explain the concept of 'sources and uses of cash.' Give three examples of sources of cash and three examples of uses of cash from a balance sheet perspective. How does this relate to the cash flow statement?

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2. (6pt) Explain the concept of loan amortization. In a typical fixed-rate loan, how does the split between interest and principal change over time? Why does this happen? Include a brief example with numbers.

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3. (6pt) Explain credit risk for bonds. What is a credit spread, and what does it represent? Distinguish between investment-grade and non-investment-grade (junk) bonds. How do bond rating agencies (Moody's, S&P) factor into the bond market?

ANSWER KEY | Mock Exam 4

Part A: True / False

1. TRUE *Agency problem: shareholders (principals) hire managers (agents). Managers may not always act in shareholders' best interest.*

2. FALSE *NCS = End.NFA - Beg.NFA + Dep. If End.NFA = Beg.NFA, then NCS = Dep (not zero). Depreciation must be replaced to maintain asset base.*

3. TRUE *A/R decrease = current asset decreasing = SOURCE of cash (cash collected from customers).*

4. TRUE *Cash coverage = EBITDA/Interest = (EBIT + Dep + Amort)/Interest. Standard definition.*

5. FALSE *Total debt ratio = TD/TA = 0.40 → TE/TA = 0.60. D/E = TD/TE = 0.40/0.60 = 0.667, not 0.40.*

6. FALSE *Higher payout → lower retention ratio b → lower SGR = ROE×b/(1-ROE×b). Payout up → SGR DOWN.*

7. TRUE *Core TVM principle: money available sooner can be invested to earn returns → worth more today.*

8. FALSE *EAR = (1+APR/m)^m - 1. Doubling m does not more than double EAR; EAR grows at a diminishing rate. It approaches e^APR-1 (continuous) as the limit.*

9. TRUE *Growing perpetuity PV = C/(r-g) when r > g. Standard formula.*

10. FALSE *Delaying by one year means you invest LATER, which means you need to invest MORE (less time to compound). So you need MORE money, not 'more money today' — you invest later but a larger amount. Trick: the statement is ambiguous. The correct interpretation: if you delay depositing, you need a larger future deposit because there's less compounding time.*

11. TRUE *Dirty (invoice) price = Clean price + Accrued interest. Bond buyers pay dirty price.*

12. FALSE *Lower coupon → HIGHER duration → GREATER interest rate risk. Lower coupon = more sensitive to rate changes.*

Part B: Short Answer / Calculation

1. Answer: NI=$230,090; EPS=$2.30; RE add=$140,090

EBIT = $1,200,000-$650,000-$140,000-$88,000 = $322,000
EBT = $322,000-$35,000 = $287,000
Taxes = $287,000×0.21 = $60,270
NI = $287,000-$60,270 = $226,730
EPS = $226,730/100,000 = $2.267 ≈ $2.27
Addition to RE = $226,730-$90,000 = $136,730

2. Answer: ΔNWC=+$30,000; NCS=$80,000

NWC(beg) = CA-CL = $520,000-$280,000 = $240,000
NWC(end) = $580,000-$310,000 = $270,000
ΔNWC = $270,000-$240,000 = +$30,000 (use of cash)
NCS = End.NFA-Beg.NFA+Dep = $1,780,000-$1,900,000+$200,000 = $80,000

3. Answer: CFFA=$370,000; CF Cred=$122,000

CFFA = OCF-NCS-ΔNWC = $480,000-$80,000-$30,000 = $370,000
CF to Creditors = Interest-Net new borrowing = $72,000-(-$50,000) = $72,000+$50,000 = $122,000
(Net new borrowing negative = debt paid down → cash went OUT to creditors)

4. Answer: TIE=6.53; Cash cov=8.42; TD ratio=0.448

TA = CA+NFA = $950,000+$3,400,000 = $4,350,000
TL = CL+LTD = $420,000+$1,680,000 = $2,100,000
TIE = EBIT/Interest = $620,000/$95,000 = 6.53×
Cash Coverage = (EBIT+Dep)/Interest = ($620,000+$180,000)/$95,000 = $800,000/$95,000 = 8.42×
Total Debt Ratio = TL/TA = $2,100,000/$4,350,000 = 0.483

5. Answer: PM=6%; AT=1.2; EM=2.5; ROE=18%; SGR=12.26%

PM = NI/Sales = $216,000/$3,600,000 = 6%
AT = Sales/TA = $3,600,000/$3,000,000 = 1.2
EM = TA/TE = $3,000,000/$1,200,000 = 2.5
ROE = PM×AT×EM = 0.06×1.2×2.5 = 18.0%
b = 1-Div/NI = 1-$64,800/$216,000 = 1-0.30 = 0.70
SGR = 0.18×0.70/(1-0.18×0.70) = 0.126/(1-0.126) = 0.126/0.874 = 14.42%

6. Answer: Car costs $43,476 in 6yr; Invest=$26,802; Over by $3,326
(a) FV = $35,000×(1.035)^6 = $35,000×1.2293 = $43,026
(b) FV of $20,000 at 5% for 6yr = $20,000×(1.05)^6 = $20,000×1.3401 = $26,802
Shortfall = $43,026-$26,802 = $16,224 short

7. Answer: Lump sum=$125,401; Annual deposit=$19,053
(a) PV = $200,000/(1.06)^8 = $200,000/1.5938 = $125,491
(b) FV annuity factor = [(1.06)^8-1]/0.06 = [1.5938-1]/0.06 = 0.5938/0.06 = 9.897
C = $200,000/9.897 = $20,208 per year

8. Answer: EAR(daily)=8.762%; EAR(cont)=8.763%
(a) EAR = (1+0.084/365)^365-1 = (1.0002301)^365-1 = 1.08762-1 = 8.762%
(b) EAR = e^0.084-1 = 1.08763-1 = 8.763%
Daily compounding approaches continuous: very close but slightly less.

9. Answer: Total PV = $17,928
PV1 = $3,000/1.07¹ = $2,804
PV2 = $5,000/1.07² = $4,367
PV3 = $8,000/1.07³ = $6,531
PV4 = $6,000/1.07⁴ = $4,578
Total PV = $2,804+$4,367+$6,531+$4,578 = $18,280

10. Answer: PV annuity=$48,827; Perpetuity PV=$75,000
(a) PV = $4,500/0.06×[1-1/(1.06)^18] = $75,000×[1-0.3503] = $75,000×0.6497 = $48,727
(b) Perpetuity PV = C/r = $4,500/0.06 = $75,000

11. Answer: Pmt=$978.05; Int month1=$765; Principal=$213
r_monthly = 5.1%/12 = 0.425% = 0.00425 | n = 360
C = $180,000×0.00425/[1-1/(1.00425)^360]
(1.00425)^360 = 4.6524 | Annuity factor = [1-0.2150]/0.00425 = 184.71
C = $180,000/184.71 = $974.48
Month 1 interest = $180,000×0.00425 = $765
Month 1 principal = $974.48-$765 = $209.48

12. Answer: Premium; P1=$1,046.07; P2 at 9.5%=$973.04
Coupon 9% > YTM 8% → PREMIUM bond
C=$45/period; r=4%; n=12
P = $45×[1-1/(1.04)^12]/0.04 + $1,000/(1.04)^12
(1.04)^12=1.6010; Annuity factor=9.385; P = $45×9.385+$624.6 = $422.3+$624.6 = $1,046.9
At YTM=9.5%: r=4.75%; P = $45×[1-1/(1.0475)^12]/0.0475+$1,000/(1.0475)^12
(1.0475)^12=1.7473; Annuity factor=8.912; P = $45×8.912+$572.3 = $401.0+$572.3 = $973.3

13. Answer: Coupon rate=6.40%; Discount bond
Periods=26; Rate/period=3.8%; (1.038)^26=2.6658; PV face=$375.13
$901.98-$375.13=$526.85 = C×annuity factor(3.8%,26)
Annuity factor=[1-1/2.6658]/0.038=16.442; C=$526.85/16.442=$32.04
Annual coupon=$64.08; Coupon rate=$64.08/$1,000=6.408%≈6.40%
Price<$1,000 → DISCOUNT bond (coupon 6.4% < YTM 7.6%)

14. Answer: 3 months accrued; AI=$20; Dirty=$1,070
Last coupon: March 1. Today: June 1. Elapsed: 3 months. Period: 6 months.
Semiannual coupon = 8%/2×$1,000 = $40
Accrued interest = $40×(3/6) = $40×0.50 = $20
Dirty (invoice) price = Clean price+Accrued = $1,050+$20 = $1,070

15. Answer: Bond A new price≈$925.61; Bond B≈$838.44; Bond B dropped more
Both at par ($1,000) when YTM=5%. C=$25/period semiannual.
Bond A (10yr, 20 periods) at YTM=6% (r=3%/period):
P = $25×[1-1/(1.03)^20]/0.03 + $1,000/(1.03)^20 = $25×14.877+$553.7 = $371.9+$553.7=$925.6
% change A = ($925.6-$1,000)/$1,000 = -7.44%
Bond B (25yr, 50 periods) at YTM=6% (r=3%/period):
P = $25×[1-1/(1.03)^50]/0.03+$1,000/(1.03)^50 = $25×25.730+$228.1=$643.2+$228.1=$871.3... ≈$872
% change B ≈ -12.8% → Bond B dropped MORE

Why: Longer TTM → higher duration → greater price sensitivity to rate changes.

Part C: Essay Key Points

1. Sources and Uses of Cash

- Sources of cash: (1) decrease in an asset, (2) increase in a liability, (3) increase in equity.
- Examples — Sources: inventory sold/decreases; accounts payable increases; new loan taken.
- Uses of cash: (1) increase in an asset, (2) decrease in a liability, (3) decrease in equity.
- Examples — Uses: buy new equipment (NFA up); pay off debt (LTD down); pay dividends (equity down).
- Connection to cash flow statement: OCF captures operating sources/uses; investing activities capture capex; financing captures debt/equity changes.
- CFFA = OCF - NCS - ΔNWC reflects net cash generated available to capital providers.

2. Loan Amortization

- Amortization = process of paying off a loan through equal periodic payments covering interest + principal.
- Each payment: first covers interest on remaining balance, remainder reduces principal.
- Over time: as balance decreases, interest portion shrinks; principal portion grows.
- This happens because interest = balance × r; lower balance → lower interest charge.
- Example: $100,000 loan, 5%, 5yr. Monthly pmt ≈ $1,887.
- Month 1: Interest=$417 (100,000×0.005), Principal=$1,470, Balance=$98,530.
- Month 60: Interest≈$9, Principal≈$1,878 (almost entirely principal).

3. Credit Risk and Bond Ratings

- Credit risk = risk that the bond issuer will default on interest or principal payments.
- Credit spread = YTM(corporate bond) - YTM(Treasury bond, same maturity). Compensates for default risk.
- Higher default risk → investors demand higher yield → wider spread → lower bond price.
- Investment grade: Moody's Baa/BBB or higher (S&P). Low default risk. Institutional investors can hold.
- Non-investment grade (junk/high-yield): Ba/BB or lower. Higher risk, higher yield.
- Rating agencies (Moody's, S&P, Fitch) assess creditworthiness. Downgrades → price drops; upgrades → price rises.
- Ratings based on: financial ratios (TIE, debt ratios), business risk, management quality, economic conditions.