Spring 2025 Name:

Final: Equity Valuation

Answer all questions and show necessary work. Please be brief. This is an open-book, open-notes exam.

1. You have been asked to review the valuation of Vulcan Enterprises. In arriving at a value of $1.5 billion for the equity, the analyst has discounted the expected free cash flows to equity of $90 million next year, expected to grow 3% a year**, at the cost of capital for the firm (instead of the cost of equity)**. If the after-tax cost of debt is 4% and the debt to capital ratio is 20%, estimate the **correct value of equity**. (3 points)

2. You have been given the expected free cash flows (in $ millions) to Narnia Inc for the next three years and have been asked to complete the valuation.

	Most recent year	1	2	3
Operating income after taxes	$150.00	$165.00	$181.50	$199.65
+ Depreciation	$40.00	$44.00	$48.40	$53.24
- Cap Ex	$100.00	$110.00	$121.00	$133.10
- Change in WC	$40.00	$44.00	$48.40	$53.24
FCFF	$50.00	$55.00	$60.50	$66.55
PV @ cost of capital of 12%		$49.11	$48.23	$47.37

Assuming that the firm is expected to maintain its current return on capital in perpetuity, and that the growth rate after year 3 will be 3% a year forever**, with a cost of capital of 9%**, **estimate the value for the firm today**. (3 points)

3. You have been asked to estimate the expected free cash flows to the firm for Reynolds Tech, each year for the next three years, and have been given the following information:

	Base	1	2	3
Revenue growth rate		12.00%	8.00%	4.00%
Operating margin (pre-tax)		3.00%	6.00%	9.00%
Invested capital ($ millions)	$500.00	$550.00	$620.00	$640.00

If the firm had revenues of $800 million in the most recent year, has an expected tax rate of 25% and is carrying an NOL of $50 million into next year, estimate the **expected FCFF for the next three years**. (3 points)

4. You are trying to value Nestor Inc., a firm that generated $150 million in net income in the most recent year, representing a return on equity of 18%. The company reported capital expenditures of $90 million during the year, depreciation of $50 million and an increase in working capital of $10 million; the company also issued $20 million more in debt than it repaid. If the company is in stable growth and expects to maintain its current return on equity and equity reinvestment rate in perpetuity, **estimate the value of equity**. (The cost of equity is 9.6%.) (3 points)

5. Romano Food is a mature food processing company, that expects after-tax operating income to grow 2% a year in perpetuity, with a cost of capital of 10%. It currently trades at a (fair) enterprise value to invested capital ratio of 0.75, but it expects to double its return on capital after a restructuring, while leaving its reinvestment rate unchanged. Estimate the **EV to invested capital ratio after the restructuring**. (3 points)

6. Colima Inc. is a privately owned business that expects to generate $30 million in free cash flows to equity next year and is an all equity-funded firm. With an expected growth rate in perpetuity of 4%, and after an illiquidity discount of 20% applied to value, the company has been valued (correctly) at $240 million to an undiversified buyer. If the same company would be valued at $480 million to a public (diversified) buyer, estimate the **correlation of the firm with the market**. (The riskfree rate is 4%, and the equity risk premium is 5%). (3 points)

7. Meridien Hotels is a struggling company that is planning to divest two-thirds of its business for $250 million and return the cash to investors. The table below summarizes the divestiture effects on the company's operating numbers:

	Before divestiture	After divestiture
After-tax operating income next year ($ mil)	$90.00	$45.00
Return on capital on new investments	*5%*	10%
Cost of capital	10%	9%
Expected growth rate	4%	3%

Estimate the value gained (or lost) by Meridien's stockholders from the divestiture. (4 points)

8. You have been asked to assess the value of synergy in a merger between two firms, Zipdoc and Health Solutions, and have collected the following information:

	Zipdoc	Health Solutions
Expected Revenues next year ($ mil)	$1,500.00	$600.00
After-tax operating income ($ mil)	$90.00	$90.00
Invested capital ($ mil)	$900.00	$450.00
Expected growth rate	3%	3%
Cost of capital	9%	9%
Tax rate	25%	25%

The merger is expected to leave operating income, invested capital and tax rate unchanged, but it will increase the expected growth rate of the combined firm to 4%. Estimate the **value of synergy in the merger**. (4 points)

9. You have been asked to assess the value of Verity Pharma, a small pharmaceutical company with two developed drugs and one more in the pipeline.
    a. The developed drugs are **expected to generate $50 million a year in after-tax cash flows** for the next ten years; the **cost of capital is 9%.**
    b. The patent has 15 years left in its life, and it **will cost $1 billion to develop the patent into a commercial product.**
    c. Using a riskfree rate of 4% and the standard deviation in oil prices, an analyst has very helpfully assessed key numbers for the option pricing model to value the patent:

d1 =	1.0067	N(d1) =	**0.8430**
d2 =	-0.1552	N(d2) =	**0.4383**

    d. The company is currently **(fairly) valued at $838.88 million**, including the value of both the developed drugs and the patent valued as an option.

Estimate the **net present value of developing the patent now**. (You can ignore the cost of delay). (4 points)