Formula reference

Use consistent dates, units and rate periods. Unless a question specifies otherwise, cash flows occur at the end of each period. r is the discount rate per period and n is the number of periods.

Financial statements and ratios

$$\text{Interest coverage} = \frac{EBIT}{\text{Interest expense}}$$

For MCQ 2, use operating income as EBIT.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Gross profit} = \text{Revenue} - \text{COGS}$$

$$\text{Gross margin} = \frac{\text{Gross profit}}{\text{Sales}}$$

$$\text{Net income} = \text{Pretax income} - \text{Income taxes}$$

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

$$\text{Asset turnover} = \frac{\text{Sales}}{\text{Book assets}}$$

$$\text{Equity multiplier} = \frac{\text{Book assets}}{\text{Market equity}}$$

DuPont convention for this exam: use year-end book assets and year-end market equity.

$$\text{ROE} = \frac{\text{Net income}}{\text{Market equity}}$$

$$\text{ROE} = \text{Net profit margin} \times \text{Asset turnover} \times \text{Equity multiplier}$$

$$\text{Market equity} = \text{Share price} \times \text{Shares}$$

$$EV = \text{Market equity} + \text{Debt} - \text{Cash}$$

Interest-rate relationships

$$i \approx r_{\text{real}} + \pi^e$$

i: nominal rate; π^e: expected inflation.

Yield curves

$$y_n \approx \frac{r_{1,0} + E[r_{1,1}] + \cdots + E[r_{1,n-1}]}{n} + TP_n$$

y_n: n-year yield; $r_{1,t}$: one-year rate at date t; TP_n: term premium. Pure expectations sets $TP_n = 0$.

Single cash flows and streams

$$FV_t = PV_0(1+r)^t, \qquad PV_0 = \frac{FV_t}{(1+r)^t}$$

$$PV_0 = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}$$

$$FV_N = \sum_t CF_t(1+r)^{N-t}$$

$$\text{Perpetuity: } PV_t = \frac{C_{t+1}}{r}$$

$$\text{Growing perpetuity: } PV_t = \frac{CF_{t+1}}{r-g}$$

The first cash flow is one period later; require $r > g$ for a growing perpetuity.

Free cash flow

$$FCF = NOPAT - \Delta NFA - \Delta NWC$$

$$FCF = NOPAT - CAPEX + \text{Depreciation} - \Delta NWC$$

NFA: net fixed assets; NWC: net working capital.

Hypothetical two-year MACRS schedule
Use these depreciation percentages over Years 1–3.

Year	Rate
1	35%
2	55%
3	10%

Assumption / row label	Value	Today (Year 0)	Year 1	Year 2	Year 3

Assumption / row label	Value	Today (Year 0)	Year 1	Year 2	Year 3