**QUESTION 1 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 20 MINUTES.**

Thomas and Elizabeth Voort, both age 45, are meeting with their financial advisor, Marc Lenard. Lenard is creating an investment policy statement for the Voorts. Thomas sold his consulting business at year-end and retired. The Voorts will rely on their investment portfolio to meet future expenses in excess of Thomas' retirement income. Elizabeth is not employed. Financial details include:

Income
Thomas will receive retirement payments of USD 125,000 per year for his lifetime from the business he sold. The retirement payments are not indexed for future inflation and are fully taxable as ordinary income.

Expenses
The Voorts' total living expenses last year were USD 300,000, and they are expected to grow each year at the inflation rate. Taxes are due immediately on the gain from the sale of the business at a rate of 15%. The Voorts do not expect any other significant cash outflows in the future.

The tax rate on ordinary income and all investment returns is 30%. The inflation rate is expected to be 2.5% per year.

Assets
The Voorts own their home, valued at USD 1,250,000, mortgage-free. They have a taxable investment portfolio with a current market value of USD 2,500,000. This portfolio has no previous tax liability due in the coming year. Thomas received a lump-sum USD 10,000,000 payment from the sale of his business; his cost basis is zero. The net proceeds of the sale will be added to the Voorts' investment portfolio. Their goals are to grow the asset base of the portfolio over time to maintain its after-tax purchasing power and to establish and maintain a cash reserve of USD 250,000.

A. **Determine** the Voorts' nominal after-tax required rate of return for the coming year. **Show** your calculations.

**(8 minutes)**

B. **State** *two* reasons why the Voorts' ability to assume risk in their investment portfolio is above average.

**(4 minutes)**

C. **Determine** the Voorts' liquidity requirement (in USD) for the coming year. **Show** your calculations.

**(3 minutes)**

Two years later, the Voorts ask Lenard to construct a new long-term strategic asset allocation with a more aggressive goal of achieving at least 3.5% annualized growth in the after-tax

purchasing power of the portfolio. They indicate that the portfolio should have only a small probability of declining more than 10% in nominal pre-tax terms in any one year. Lenard explains to the Voorts that a normal distribution can be used to model the portfolio returns. The Voorts agree to use a two-standard-deviation approach to monitor the shortfall risk of the portfolio.

Expected inflation remains 2.5% per year and the tax rate remains 30%. Based on his current market outlook, Lenard considers three potential portfolio allocations for the Voorts as shown in Exhibit 1.

**Exhibit 1**
**Potential Long-Term Strategic Portfolios**

| **Asset Class** | **Expected Annual Return** | **Portfolio X** | **Portfolio Y** | **Portfolio Z** |
|---|---|---|---|---|
| Stocks | 11.0% | 70% | 55% | 60% |
| Bonds | 6.0% | 25% | 35% | 35% |
| Cash | 2.5% | 5% | 10% | 5% |
| | | | | |
| Pre-tax expected return (nominal) | | 9.3% | 8.4% | 8.8% |
| Expected standard deviation (nominal) | | 11.0% | 8.7% | 9.3% |

D. **Determine** the *most* appropriate portfolio from Exhibit 1 for the Voorts, given their objectives and constraints. **Justify** your response with *two* reasons.

**(5 minutes)**

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