

# L31: Token Classification and Valuation

## Module D: Tokenomics

Blockchain & Cryptocurrency

December 2025

- Apply the Howey Test to classify tokens as securities
- Distinguish between utility and security tokens
- Apply valuation frameworks to crypto assets
- Analyze network value metrics (NVT, Metcalfe)
- Case Study: SEC vs. Ripple

**Building on L30:** Distribution and Vesting

## [COMIC: Is it a security? anxiety]

*A visual narrative showing founders nervously wondering if regulators will classify their token as a security*

## What This Illustrates

- Token classification determines legal fate
- Securities face strict regulations and penalties
- The line between utility and security is blurry

## The Question

*How do we know when a token crosses the line into securities territory?*

*Visual framing: The regulatory uncertainty haunting token creators*

# The Problem: When is a token a security?

## The Challenge

Token creators and investors face legal uncertainty: launching a token could trigger securities regulations with severe penalties, but the classification rules are ambiguous. The same token might be a security in one jurisdiction but not another, or treated differently based on how it's sold.

## Why It Matters

- Misclassification leads to SEC enforcement, delisting, and \$1B+ penalties (e.g., Ripple case)
- ICO boom (2017-2018) resulted in 80% of projects facing regulatory scrutiny

## What We Need

- Risk management and mitigation
- Clear legal framework distinguishing securities from utility tokens

## The Cryptoeconomics Question

*Managing systemic and idiosyncratic risks*

*Today's lesson: How Token Classification addresses this challenge*

# Why Does Token Classification Matter?

## Regulatory Implications:

- Securities require registration with SEC (in US)
- Investor protections apply
- Trading restrictions (accredited investors only)
- Disclosure requirements

## Market Implications:

- Exchange listings (securities can't list on most exchanges)
- Global accessibility
- Tax treatment

**Bottom Line:** Misclassification can lead to enforcement actions, delisting, and legal penalties.

*Problem: What happens if you misclassify a token? — Securities violations trigger SEC enforcement, exchange delisting, and multi-billion dollar penalties*

**Continued**

# What Is the Howey Test?

**Origin:** SEC v. W.J. Howey Co. (Supreme Court case)

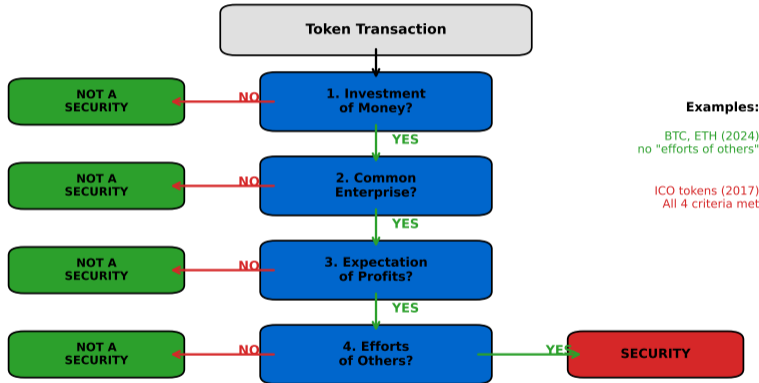
**An investment is a security if it involves:**

- ① **Investment of Money** - Investors provide capital
- ② **In a Common Enterprise** - Pooled funds with shared economic outcome (investors' fortunes tied together)
- ③ **With Expectation of Profits** - Investors seek financial return
- ④ **Derived from Efforts of Others** - Profits depend on promoter/third party work

**All four criteria must be met** for classification as a security.

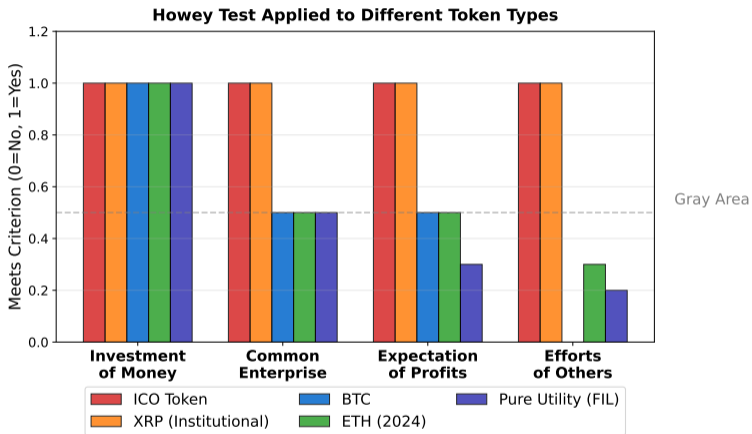
*Key point: Origin*

## Howey Test Decision Tree SEC v. W.J. Howey Co. (1946)



*If ANY criterion fails, the token is NOT a security. All four must be met.*

# Howey Test Applied to Tokens



*BTC and ETH largely avoid "efforts of others" due to decentralization*

# How Do Utility Tokens Differ from Security Tokens?

## Utility Token

- Access to product/service
- Not marketed as investment
- Value from usage, not speculation
- Examples: BNB, FIL

## Howey Test:

- Fails “efforts of others” if decentralized

**Reality:** Most tokens exist on a spectrum, not binary classification.

## Security Token

- Investment contract
- Promise of profits
- Centralized management
- Examples: Tokenized stocks

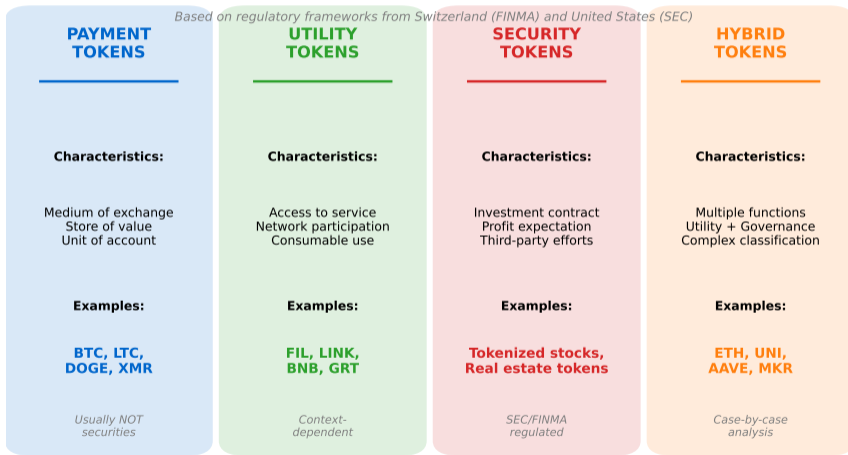
## Howey Test:

- Meets all four criteria

*Compare the approaches shown above*

## Token Classification Framework (FINMA / SEC)

Based on regulatory frameworks from Switzerland (FINMA) and United States (SEC)



FINMA/SEC taxonomy: Payment, Utility, Security, and Hybrid tokens have distinct regulatory treatment

# What Did the Ripple Case Reveal About Classification?

## Background:

- Ripple Labs created XRP (2012)
- Used for cross-border payments
- Ripple holds 50% of XRP supply
- \$1.3B raised from XRP sales (2013-2020)

## SEC Complaint (Dec 2020):

- XRP is an unregistered security
- Ripple raised funds through illegal securities offering

## Ripple's Defense:

- XRP is a currency, not a security
- Network is decentralized (1,000+ validators)

*Problem: Can the same token be both a security and not a security? — The Ripple case shows context of sale determines classification, not the token itself*

# What Was the Ripple Verdict?

## Judge Torres Decision - Partial Victory for Ripple:

### 1. Institutional Sales = Securities

- XRP sold to VCs/hedge funds = securities
- Buyers had expectation of profits from Ripple's efforts

### 2. Programmatic Sales (Exchanges) = NOT Securities

- XRP sold on public exchanges = not securities
- Buyers didn't know they were buying from Ripple

### 3. Employee Compensation = NOT Securities

**Impact:** First major ruling that distinguished sale context matters.

*Key point: Judge Torres Decision - Partial Victory for Ripple*

# Why Is Token Valuation So Difficult?

## Why Traditional Valuation is Hard:

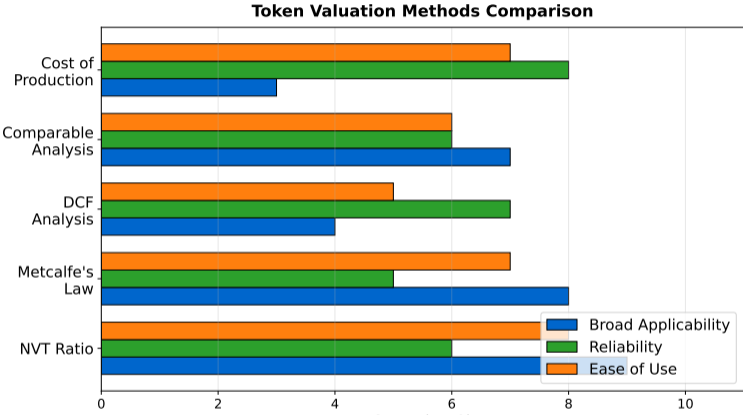
- No cash flows (most tokens)
- No earnings or revenue
- No tangible assets
- Highly speculative markets
- Network effects hard to quantify

## Approaches:

- 1 Network Value to Transactions (NVT)
- 2 Metcalfe's Law
- 3 Discounted Cash Flow (DCF) - for productive assets
- 4 Comparable Analysis
- 5 Cost of Production (mining)

*Key point: Why Traditional Valuation is Hard*

# Valuation Methods Comparison



Use multiple methods; no single approach is definitive for crypto valuation

*NVT is most widely applicable; DCF only works for yield-generating tokens*

## Recall Our Problem

*When is a token a security?*

## What We've Learned So Far

- The Howey Test uses four criteria to determine if an asset is a security
- Utility tokens avoid "efforts of others" criterion through sufficient decentralization
- Classification determines regulatory requirements, exchange access, and legal risk

## Still to Address

- Valuation frameworks (NVT, Metcalfe's Law, DCF) for pricing tokens
- How do we value tokens with no cash flows and no comparable assets?

## Think About

- Based on what you've seen, how would *you* solve this problem?
- What trade-offs do you expect?

*Pause and reflect: How does what we've learned so far address "When is a token a security?"?*

# How Does NVT Ratio Work?

## Formula:

$$\text{NVT Ratio} = \frac{\text{Market Cap}}{\text{Daily Transaction Volume}}$$

## Interpretation:

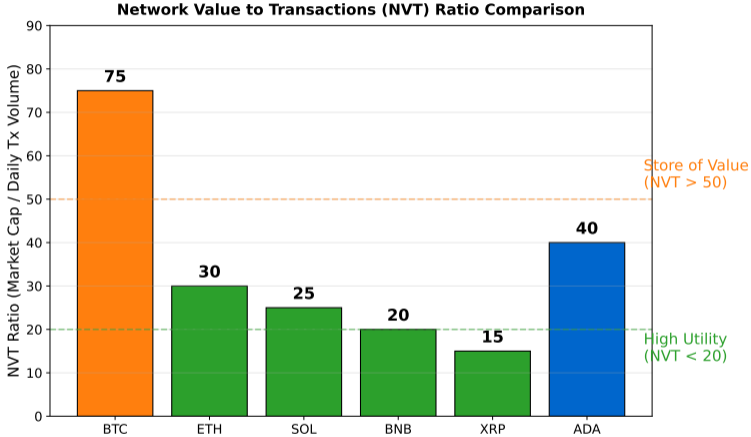
- Similar to P/E ratio in stocks
- High NVT = overvalued relative to usage
- Low NVT = undervalued or high utility

## Typical Ranges:

- BTC: 50-100 (higher = store of value, not payment)
- ETH: 20-40 (more transactional)
- Payment tokens:  $\leq 20$  (high transaction volume)

*Problem: How do we value tokens that generate no cash flows? — NVT ratio compares market cap to usage, providing relative valuation like P/E ratios for stocks*

# NVT Ratio Comparison



*BTC's high NVT reflects store-of-value use; lower NVT indicates payment utility*

# What Does Metcalfe's Law Tell Us About Network Value?

**Concept:** Network value grows with the square of the number of users.

**Formula:**

$$V \propto n^2$$

where  $V$  = network value,  $n$  = number of users.

**Application to Crypto:**

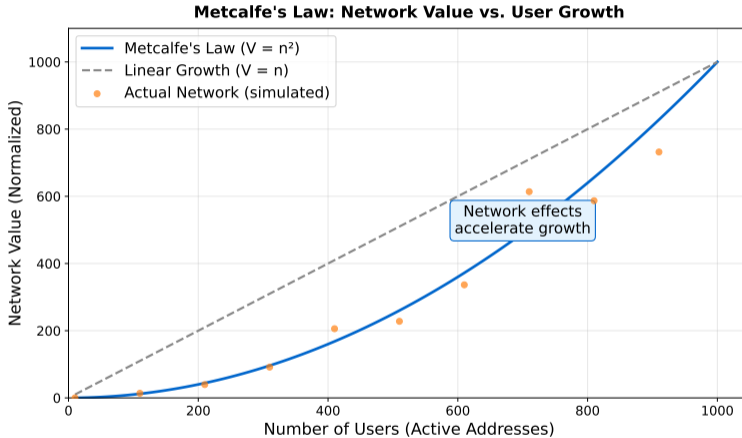
- More users = exponentially more connections
- Active addresses proxy for  $n$
- Studies show BTC/ETH follow Metcalfe's Law loosely

**Limitations:**

- Not all users create equal value
- Doesn't account for quality of usage

*Key point: Concept*

# Metcalfe's Law Visualization



*Network effects create exponential value growth as user count increases*

# When Can We Use DCF for Token Valuation?

**When to Use:** Tokens with cash flow generation (staking rewards, fee sharing).

*Note: If you've taken corporate finance, DCF is familiar. If not, think of it as calculating "what is a future stream of payments worth today, accounting for the time value of money?"*

**Formula:**

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

where  $CF_t$  = cash flow in year  $t$ ,  $r$  = discount rate.

## Example: Staking Token

- Expected annual staking reward: \$100
- Discount rate: 10%
- Perpetual reward assumption

$$\text{Value} = \frac{100}{0.10} = \$1,000$$

*Problem: When can we use traditional finance valuation? — DCF applies only to tokens with predictable cash flows (staking rewards, fee sharing)*

# What's the Difference Between Market Cap and FDV?

## Market Cap:

$$\text{Market Cap} = \text{Price} \times \text{Circulating Supply}$$

## Fully Diluted Valuation (FDV):

$$\text{FDV} = \text{Price} \times \text{Total Supply (Max)}$$

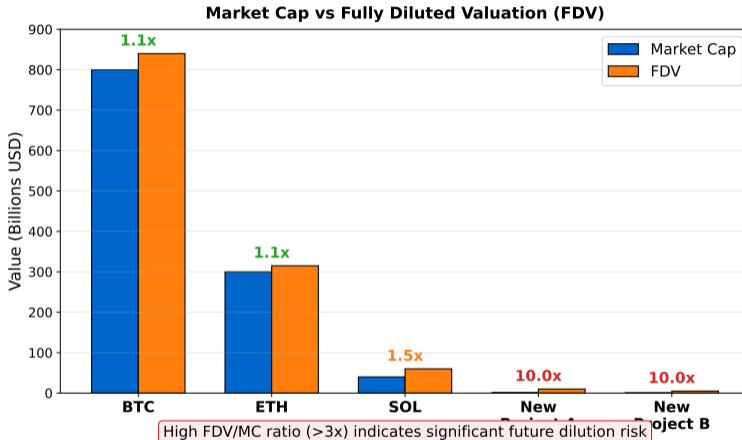
## Example:

- Token price: \$10, Circulating: 100M, Total: 1B
- Market Cap: \$1B
- FDV: \$10B

**Warning:** Large FDV/MC ratio indicates future dilution risk (your ownership percentage shrinks as locked tokens enter circulation).

*Key point: Market Cap*

# Market Cap vs FDV Comparison



*New projects often have 10x+ FDV/MC ratio indicating massive dilution ahead*

# How Should You Approach Token Valuation?

## Step-by-Step Analysis:

- 1 Determine token type and purpose (utility, governance, etc.)
- 2 Check regulatory status (security vs. non-security)
- 3 Calculate NVT ratio (compare to peers)
- 4 Analyze on-chain metrics (addresses, transactions, TVL)
- 5 Review tokenomics (supply, inflation, unlock schedule)
- 6 Compare market cap to fundamentals (revenue, usage)
- 7 Assess FDV vs. Market Cap (dilution risk)

**Output:** Informed estimate of fair value range (not precise number).

*Key point: Step-by-Step Analysis*

## The Original Problem

*When is a token a security?*

## How Token Classification Solves It

- Howey Test provides four-criteria framework: investment of money, common enterprise, expectation of profits, efforts of others
- FINMA taxonomy distinguishes payment, utility, and asset tokens based on economic function
- Context matters: Ripple ruling showed same token can be security (institutional sales) or not (exchange sales)

## Remaining Limitations

- Regulatory uncertainty persists: no global standard, jurisdiction shopping common (Switzerland, Singapore)
- Gray area tokens (hybrid utility/governance) still lack clear classification

## Open Questions

- Will MiCA (EU) and international coordination lead to regulatory harmonization by 2030?
- Risk: Black swan events (e.g., major exchange listing security unknowingly), cascading enforcement actions

*Token Classification partially solves "When is a token a security" but introduces new trade-offs*

## Incentive Structure

- Managing systemic and idiosyncratic risks
- Risk-adjusted returns, insurance mechanisms
- Users bear risk for higher returns

## Economic Security

- Attack cost must exceed potential gain
- Honest behavior = Nash equilibrium (game theory: no player gains by unilaterally changing strategy)

*Cryptoeconomic security: Honest behavior must be the Nash equilibrium*

## Key Economic Question

### Who Pays, Who Earns?

Users bear risk for higher returns

## Design Principle

Attack Cost  $>$  Potential Gain

## Alternatives Considered

- 1 Risk parameters, circuit breakers
- 2 Traditional risk management approaches

## Trade-offs Made

- Every design optimizes some properties
- ... at the expense of others

## Design Questions

- What would YOU change?
- What's optimized? What's sacrificed?
- Are there other approaches?

## Key Insight

### No Perfect Solution

All blockchain designs involve trade-offs between decentralization, security, and scalability.

*Every design is a trade-off. Understanding alternatives reveals the "why" behind choices.*

## Failure Modes

## Critical Failure Mode

- **What breaks:** Black swan events, cascading failures
- **Why it happens:** Economic incentives misaligned

## Root Cause

- Assumption violated
- Incentive structure broken
- External shock

## Historical Context

- Multiple real-world failures documented
- Patterns repeating across protocols

## Early Warning Signs

- ! Unusual economic behavior
- ! Incentive misalignment
- ! Centralization drift

*Prediction: What could cause this to fail? How would you detect it early?*

## [COMIC: Utility token excuse]

*A visual narrative showing a project claiming “it’s just a utility token!” while regulators remain skeptical*

## What We Learned

- Howey Test determines security classification
- Context of sale matters (Ripple precedent)
- “Utility” label doesn’t guarantee non-security status

## The Takeaway

*Classification depends on economic reality, not marketing labels—regulators look at substance over form.*

*Visual synthesis: The gap between token marketing and regulatory reality*

## Key Takeaways:

- Howey Test determines security classification (4 criteria)
- Context of sale matters (Ripple case precedent)
- NVT ratio helps assess value relative to transaction volume
- Metcalfe's Law suggests network value grows with users squared
- DCF applicable only to tokens with cash flows
- Comparable analysis useful for relative valuation
- Always compare Market Cap to FDV (dilution risk)
- Crypto valuation is imprecise - use multiple methods

**Next Lesson:** L32 – Lab: Tokenomics Analysis

*Key point: Key Takeaways*

- 1 Apply the Howey Test to a token you're familiar with. Is it a security?
- 2 Why did the Ripple ruling distinguish between institutional and exchange sales?
- 3 Calculate the NVT ratio for Bitcoin and Ethereum. What does it tell you?
- 4 What are the limitations of using Metcalfe's Law for token valuation?
- 5 How would you value a governance token with no direct cash flows?

*Key point: Questions for Reflection*

Quiz

## Quiz Questions (1–5)

**Q1. How many criteria must be met under the Howey Test for an asset to be classified as a security?**

- A) Two   B) Three   C) Four   D) Five

**Answer: C** – All four criteria (investment of money, common enterprise, expectation of profits, efforts of others) must be met.

**Q2. Which of the following is NOT one of the four Howey Test criteria?**

- A) Investment of money   B) Common enterprise   C) Government approval   D) Efforts of others

**Answer: C** – Government approval is not part of the Howey Test. The four criteria are: investment of money, common enterprise, expectation of profits, and efforts of others.

**Q3. What was the key distinction in the SEC vs. Ripple ruling (July 2023)?**

- A) All XRP sales were securities   B) No XRP sales were securities  
C) Context of sale matters (institutional vs. exchange)   D) Ripple was completely acquitted

**Answer: C** – Judge Torres ruled that institutional sales were securities, but programmatic exchange sales were not, establishing that sale context matters.

**Q4. What percentage of XRP supply does Ripple Labs hold?**

- A) 10%   B) 25%   C) 50%   D) 75%

**Answer: C** – Ripple holds approximately 50% of the XRP supply, which was a key factor in the SEC's case.

**Q5. According to the lesson, which tokens are examples of utility tokens?**

- A) BTC and ETH   B) BNB and FIL   C) XRP and ADA   D) Tokenized stocks

**Answer: B** – BNB (Binance Coin) and FIL (Filecoin) are cited as examples of utility tokens providing access to products/services.

## Quiz Questions (6–10)

**Q6. What does NVT stand for in token valuation?**

- A) Network Value Total
- B) Network Value to Transactions
- C) Net Value Transfer
- D) New Value Token

**Answer: B** – NVT stands for Network Value to Transactions, calculated as Market Cap divided by Daily Transaction Volume.

**Q7. What is the typical NVT ratio range for Bitcoin according to the lesson?**

- A) 5-10
- B) 20-40
- C) 50-100
- D) 150-200

**Answer: C** – BTC typically has an NVT ratio of 50-100, reflecting its primary use as a store of value rather than for payments.

**Q8. According to Metcalfe's Law, how does network value grow with the number of users?**

- A) Linearly ( $n$ )
- B) Logarithmically ( $\log n$ )
- C) Squared ( $n^2$ )
- D) Exponentially ( $e^n$ )

**Answer: C** – Metcalfe's Law states that network value is proportional to the square of the number of users ( $V \propto n^2$ ).

**Q9. What does a high NVT ratio indicate?**

- A) Undervalued token
- B) Overvalued relative to usage
- C) High transaction volume
- D) Low market capitalization

**Answer: B** – A high NVT ratio suggests the token is overvalued relative to its transaction volume (similar to a high P/E ratio in stocks).

**Q10. Which valuation method is most appropriate for tokens with staking rewards?**

- A) NVT Ratio
- B) Metcalfe's Law
- C) Discounted Cash Flow (DCF)
- D) Cost of Production

**Answer: C** – DCF is suitable for tokens with cash flow generation, such as staking rewards or fee sharing.

## Quiz Questions (11–15)

**Q11. What is the formula for Market Cap?**

- A) Price  $\times$  Total Supply
- B) Price  $\times$  Circulating Supply
- C) Price  $\div$  Circulating Supply
- D) Total Supply  $\times$  FDV

**Answer: B** – Market Cap = Price  $\times$  Circulating Supply (only tokens currently in circulation).

**Q12. What does FDV stand for?**

- A) Final Distribution Value
- B) Fully Diluted Valuation
- C) Future Development Value
- D) Fixed Derivative Value

**Answer: B** – FDV stands for Fully Diluted Valuation, calculated as Price  $\times$  Total Supply (maximum).

**Q13. A large FDV/Market Cap ratio indicates:**

- A) Undervaluation
- B) High current circulation
- C) Future dilution risk
- D) Low token price

**Answer: C** – A high FDV/MC ratio (e.g., 10x+) indicates significant future dilution risk as locked tokens are released.

**Q14. Which Howey Test criterion do Bitcoin and Ethereum largely avoid due to decentralization?**

- A) Investment of money
- B) Common enterprise
- C) Expectation of profits
- D) Efforts of others

**Answer: D** – BTC and ETH are sufficiently decentralized that profits do not primarily depend on the “efforts of others”.

**Q15. What is a key limitation of using Metcalfe’s Law for crypto valuation?**

- A) It requires cash flow data
- B) Not all users create equal value
- C) It only applies to Bitcoin
- D) It ignores market capitalization

**Answer: B** – Metcalfe’s Law doesn’t account for the quality of usage or the fact that not all users create equal value in the network.

## Quiz Questions (16–20)

**Q16. In the Ripple case, which type of XRP sales were ruled as securities?**

- A) All sales
- B) Institutional sales to VCs and hedge funds
- C) Programmatic sales on exchanges
- D) Employee compensation

**Answer: B** – Institutional sales to VCs/hedge funds were ruled as securities because buyers had expectation of profits from Ripple's efforts.

**Q17. What regulatory requirement applies if a token is classified as a security in the US?**

- A) Mining permit
- B) Registration with SEC
- C) Blockchain audit
- D) Federal tax exemption

**Answer: B** – Securities require registration with the SEC, along with investor protections and disclosure requirements.

**Q18. If a staking token provides \$100 annual rewards with a 10% discount rate (perpetual), what is its DCF value?**

- A) \$100
- B) \$500
- C) \$1,000
- D) \$10,000

**Answer: C** – Using the perpetuity formula:  $\text{Value} = \$100 / 0.10 = \$1,000$ .

**Q19. What is the typical NVT ratio range for payment-focused tokens?**

- A) <20
- B) 20-40
- C) 50-100
- D) >100

**Answer: A** – Payment tokens typically have  $\text{NVT} < 20$  due to high transaction volume relative to market cap.

**Q20. Which statement best describes token valuation in crypto?**

- A) Always use DCF exclusively
- B) NVT ratio provides precise fair value
- C) Use multiple methods; valuation is imprecise
- D) Market cap alone determines value

**Answer: C** – Crypto valuation is imprecise and requires using multiple methods (NVT, Metcalfe, DCF, comparables) to estimate a fair value range.