CMT LEVEL I
2020 Exam
Information and Samples

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Level I. An Introduction to Technical Analysis

The following sample CMT Level I questions offer a glimpse into the style and scope of the exam. Each of the sample questions is followed by a relevant excerpt and citation from the 2020 CMT Level I curriculum. These 15 samples are by no means a study guide; instead, consider them a taste of what a Level I candidate will learn to master this segment of the body of knowledge.

Important points to note

- The CMT Level I exam tests on introductory concepts and definitions in technical analysis.

- The actual exam consists of 132 multiple-choice questions of which 120 are scored items. The remaining 12 questions are under trial for future use.

- Candidates have two hours to complete the 132 questions on the exam.

- The exam is delivered on a computer in Prometric testing facilities. Please be sure to schedule your exam well in advance.

- Questions on the Code of Ethics and Standards of Professional Conduct appear on all three levels of the CMT exams. The Standards of Practice Handbook is a valuable study guide for the Code and Standards. Please use those documents as ethics are not otherwise included in the CMT Program textbooks.

- The CMT Association maintains a discussion forum for CMT candidates. Candidates are encouraged to utilize this resource to discuss and clarify their understanding of the subject matter.

Knowledge Domain: Theory and History

1. According to the work of Charles Dow and his successors, now referred to as Dow Theory, which of the following is NOT a hypothesis for the nature of markets and technical analysis?

   A. The primary trend is inviolate.
   B. The averages discount everything.
   C. Dow Theory is not infallible.
   D. Prices move at random.

   "Rhea presented three hypotheses:
   1. The primary trend is inviolate.
   2. The averages discount everything.
   3. Dow Theory is not infallible.

   -- Kirkpatrick and Dahlquist
   CMT Level I Curriculum (2020), Chapter 2, page 17
   Learning Objective: Discuss the basic principles of Dow Theory

   D. Prices move at random.

2. In relation to the principles of technical analysis, the phrase "patterns are fractal" refers to the assumption that

   A. patterns tend to break existing trends.
   B. Mandelbrot originated the concept of chart patterns.
   C. pattern analysis is universal and independent of time.
   D. chart patterns found in an intraday chart can generate signals in a daily chart.

   "This ability for trends to act similarly over different periods is called their fractal nature. Fractal patterns or trends exist in nature along shorelines, in snowflakes, and elsewhere. For example, a snowflake is always six-sided—having six branches, if you will. ... The trading markets are similar in that any period we look at—long, medium, or very short—produces trends with the same characteristics and patterns as each other. Thus, for analysis purposes, the length of the trend is irrelevant because the technical principles are applicable to all of them. The trend length of interest is determined solely by the investor's or trader's period of interest."

   -- Kirkpatrick and Dahlquist
   CMT Level I Curriculum (2020), Chapter 1, page 9
   Learning Objective: Define "fractal" as used in describing price action

   C. pattern analysis is universal and independent of time.

Knowledge Domain: Market Indicators

3. The TRIN, or Arms Index, is calculated by

    A. dividing total specialist short sales by total short sales.
    B. subtracting the 26-day simple moving average from the 12-day simple moving average.
    C. subtracting the advance/decline ratio by the ratio of advancing volume to declining volume.
    D. dividing the advance/decline ratio by the ratio of advancing volume to declining volume.

"One of the most popular up and down volume indicators is the Arms Index, created by Richard W. Arms, Jr. (winner of the MTA 1995 Annual Award). The Arms Index (Arms, 1989), also known by its quote machine symbols of TRIN and MKDS, ... measures the relative volume in advancing stocks versus declining stocks. When a large amount of volume in declining stock occurs, the market is likely at or close to a bottom. Conversely, heavy volume in advancing stocks is usually healthy for the market. The Arms Index is actually a ratio of two ratios, as follows:
    Arms Index = (Advances / Declines) / (UpVolume / DownVolume)
The numerator is the ratio of the advances to declines, and the denominator is the ratio of the up volume to the down volume."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 14, page 331
Learning Objective: Describe other measures of internal stock-market strength such as McClellan's calculations

D. dividing the advance/decline ratio by the ratio of advancing volume to declining volume.

4. If the VIX is quoted at 20, it indicates the market is expecting a movement of about _____ percent over the next 30 days.

A. 3.77
B. 5.77
C. 3.33
D. 5.07

"To determine the anticipated 30-day movement of the stock market as defined by the VIX involves dividing the VIX by the square root of 12. ... The square root of 12 is a convenient number as 30 days is the average month and there are 12 months in the year. In a similar manner to breaking down what implied volatility was indicating about movement in Amazon stock, the VIX may be used to determine the anticipated 30-day move for the S&P 500. If the VIX is quoted at 20, the result would be the market expecting movement of about 5.77 percent over the next 30 days. Following the formula for determining 30-day market movement, the math would be:
  5.77% = 20/3.46"

B. 5.77

Knowledge Domain: Construction

5. When analyzing long term price movements, it could be helpful to use _____ chart.

    A. a logarithmic
    B. a candlestick
    C. an EquiVolume
    D. a point and figure

"Although the arithmetic scale is the scale most often used, sometimes adjustments need to be made, especially when observing long-term price movements. ... On the arithmetic scale ... a $10 price movement is visually the same whether it is a move from $50 to $60 or a move from $100 to $110. This type of scale can be somewhat deceptive; a $10 move is much more significant to an investor if the price of a security is $50 than if the price of the security is $100. The logarithmic scale addresses this issue. On the logarithmic scale, the vertical distance represents the same percentage change in price. ... The rule of thumb for when to use an arithmetic or logarithmic scale is that when the security's price range over the period being investigated is greater than 20%, a logarithmic scale is more accurate and useful. As a rule, the truly long-term charts (more than a few years) should always be plotted on logarithmic scales."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 3, page 42
Learning Objective: Explain the differences between arithmetic and logarithmic scales and their uses

A. a logarithmic

Knowledge Domain: Trend Analysis

6. An exponential moving average

    A. gives more weight to the most recent observation.
    B. gives less weight to the most recent observation.
    C. gives equal weight to all observations.
    D. does not suffer from any lag.

"...in certain situations, the most recent stock price may have more bearing on the future direction of the stock than the ten-day old stock price does. If observations that are more recent contain more relevant information than earlier observations, we want to weight data in favor of the most recent observation. By calculating a weighted moving average, the most recent day's information is weighted more heavily. This weighting scheme gives the most recent observation more importance in the moving average calculation."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 6, page 105
Learning Objective: Explain how to calculate simple, linearly weighted and exponentially smoothed moving averages

A. gives more weight to the most recent observation.

7. Violated support levels typically

   A. lose importance after three weeks.
   B. indicate an imminent price reversal.
   C. lose importance after three months.
   D. become resistance.

"The concept of support and resistance presumes that in the future prices will stop at these recorded levels or zones and that they represent a remembered psychological barrier for prices. The zones will carry through time and become barriers to future price action. Not only will the zones carry through time, but once they are broken through, they will switch functions. Previous support will become resistance, and previous resistance will become support."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 4, page 54
Learning Objective: Describe the concept of support and resistance,
and the underlying psychology

      D. become resistance.

8. A narrowing of Bollinger Bands normally indicates that

A. a stock is ready for a rally.
B. a stock is ready for a decline.
C. a stock's volatility has increased.
D. a stock's volatility has decreased.

"Bands are also envelopes around a moving average but, rather than being fixed in size, are calculated to adjust for the price volatility around the moving average. They, thus, shrink when prices become calm and expand when prices become volatile. The most widely used band is the Bollinger Band, named after John Bollinger (2002)."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 6, page 118
Learning Objective: List common envelope, channel, and band indicators and their characteristics

D. a stock's volatility has decreased.

Knowledge Domain: Chart and Patterns

9. A breakaway gap usually

    A. provides a major divergence signal.
    B. signals the beginning of a new trend.
    C. occurs at the end of an important price move.
    D. occurs during the accumulation phase of the market cycle.

"... prices suddenly break through a formation boundary and a major change in trend direction begins. Breakaway gaps signal that a pattern is completed and a boundary penetrated."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 8, page 163
Learning Objective: Describe the types of gaps that occur on price charts and their significance

B. signals the beginning of a new trend.

10. A flag is generally formed by a_____in a bull market or a_____in a bear market.

    A. rally, pullback
    B. rally, correction
    C. correction, rally
    D. correction, throwback

"Flags and pennants are really variations of the same formation. The flag is a short channel that usually slopes in the opposite direction from the trend."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 7, page 153
Learning Objective: Identify "half-mast" chart patterns such as flags and pennants

C. correction, rally

11. Identify the chart formation below.
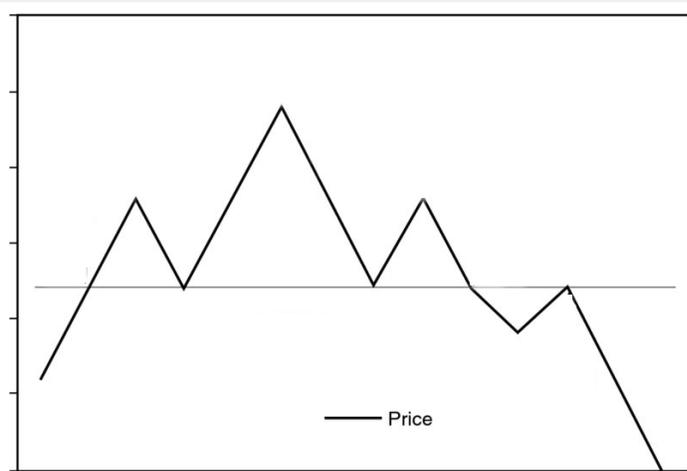
A. triple top
B. rising wedge
C. rounding top
D. head and shoulders top

"The head-and-shoulders pattern is probably the most famous technical pattern. Its name is often used when ridiculing technical analysis, yet its profitability is high, relative to other patterns, and it is one of the few that the Lo, Mamaysky, and Wang (2000) study showed had statistical significance.

The head-and-shoulders top pattern is a series of three well-defined peaks, either sharp or rounded. The second peak is higher than the first and third peak. This middle, higher peak is called the head. The first peak is called the left shoulder, and the third peak is called the right shoulder. Both the left and right shoulders must be lower than the head, but the two shoulders do not have to be the same height."

-- Kirkpatrick and Dahlquist
CMT Level I Curriculum (2020), Chapter 7, page 150-151
Learning Objective: Identify rounding chart patterns such as head-and-shoulders

D. head and shoulders top

Knowledge Domain: Confirmation

12. The basis of On-Balance-Volume (OBV) is the belief that

    A. price precedes volume.
    B. volume precedes price.
    C. volume matters most during breakouts.
    D. volume and price are typically coincident indicators.

"How can the OBV be used in prices that are in a consolidation pattern or trading range rather than trending? When prices are in a trading range and the OBV breaks its own support or resistance, the break often indicates the direction in which the price breakout will occur. Therefore, it gives an early warning of breakout direction from a price pattern."

    B. volume precedes price.

13. The stochastics indicator measures

    A. where today's typical price fits into the recent trading range.
    B. the distance in percentage between the first and last values over n-days.
    C. the relative position of the closing price within a past high-low range.
    D. the relative strength of the current price movement as it increases from 0 to 100.

"The stochastic ... looks at the most recent close price as a percentage of the price range (high to low) over a specified past "window" of time. This makes it sensitive to recent action."

    C. the relative position of the closing price within a past high-low range.

Knowledge Domain: Selection and Decision

14. A rising relative strength line for a stock in a falling market indicates that

    A. price and volume are diverging.
    B. the stock is performing worse than the market.
    C. the stock is performing better than the market.
    D. it may be moving into an overbought state.

"By using ranks that measure relative strength, the co-movement of stocks is filtered out."

-- Levy
CMT Level I Curriculum (2020), Chapter 41, page 617
Learning Objective: Explain the value of relative strength
in analyzing stock price movements

C. the stock is performing better than the market.

Knowledge Domain: Systems

15. Objective technical analysis methods

    A. normally witness less drawdown.
    B. normally witness high drawdown.
    C. require a disciplined approach for success.
    D. are well-defined procedures that issue unambiguous signals.

"In contrast, objective methods are clearly defined. When an objective analysis method is applied to market data, its signals or predictions are unambiguous. This makes it possible to simulate the method on historical data and determine its precise level of performance. This is called back testing. The back testing of an objective method is, therefore, a repeatable experiment which allows claims of profitability to be tested and possibly refuted with statistical evidence. This makes it possible to find out which objective methods are effective and which are not."

-- Aronson
CMT Level I Curriculum (2020), Chapter 38, page 556
Learning Objective: Describe objective and subjective
methods in technical analysis

D. Are well-defined procedures that issue unambiguous signals.