04 PROBABITLITY TRESS AND CONDITIONAL EXPECTIONS

1. There is a 60% chance that the economy will be good next year and a 40% chance that it will be bad. If the economy is good, there is a 70% chance that XYZ Incorporated will have EPS of $5.00 and a 30% chance that their earnings will be $3.50. If the economy is bad, there is an 80% chance that XYZ Incorporated will have EPS of $1.50 and a 20% chance that their earnings will be $1.00. What is the firm's expected EPS?

   (A) $3.29.

   (B) $5.95.

   (C) $2.75.

2. An analyst announces that an increase in the discount rate next quarter will double her earnings forecast for a firm. This is an example of a:

   (A) use of Bayes' formula.

   (B) joint probability.

   (C) conditional expectation.

3. An economist estimates a 60% probability that the economy will expand next year. The technology sector has a 70% probability of outperforming the market if the economy expands and a 10% probability of outperforming the market if the economy does not expand. Given the new information that the technology sector will not outperform the market, the probability that the economy will not expand is closest to:

   (A) 54%.

   (B) 33%.

   (C) 67%

4. The probability of A is 0.4. The probability of AC is 0.6. The probability of (B | A) is 0.5, and the probability of (B | A^C) is 0.2. Using Bayes' formula, what is the probability of (A | B)?

   (A) 0.375.

   (B) 0.625.

   (C) 0.125.

5. An investor is considering purchasing ACQ. There is a 30% probability that ACQ will be acquired in the next two months. If ACQ is acquired, there is a 40% probability of

earning a 30% return on the investment and a 60% probability of earning 25%. If ACQ not acquired, the expected return is 12%. What is the expected return on this investment?

(A) 18.3%.

(B) 16.5%.

(C) 12.3%

6. A two-sided but very thick coin is expected to land on its edge twice out of every 100 flips. And the probability of face up (heads) and the probability of face down (tails) are equal. When the coin is flipped, the prize is $1 for heads, $2 for tails, and $50 when the coin lands on its edge. What is the expected value of the prize on a single coin toss?

(A) $2.47.

(B) $1.50.

(C) $17.67.

7. A parking lot has 100 red and blue cars in it.

• 40% of the cars are red.

• 70% of the red cars have radios. `

• 80% of the blue cars have radios.

What is the probability that the car is red given that it has a radio?

(A) 37%.

(B) 28%.

(C) 47%.

8. An analyst expects that 20% of all publicly traded companies will experience a decline in earnings next year. The analyst has developed a ratio to help forecast this decline. If the company has a decline in earnings, there is a 90% probability that this ratio will be negative. If the company does not have a decline in earnings, there is only a 10% probability that the ratio will be negative. The analyst randomly selects a company with a negative ratio. Based on Bayes' theorem, the updated probability that the company will experience a decline is:

(A) 18%.

(B) 26%.

(C) 69%.

9. Bonds rated B have a 25% chance of default in five years. Bonds rated CCC have a 40% chance of default in five years. A portfolio consists of 30% B and 70% CCC-rated

bonds. If a randomly selected bond defaults in a five-year period, what is the probability that it was a B-rated bond?

(A) 0.211.

(B) 0.250.

(C) 0.625

10. There is a 40% probability that an investment will earn 10%, a 40% probability that the investment will earn 12.5%, and a 20% probability that the investment will earn 30%. What are the mean expected return and the standard deviation of expected returns, respectively?

(A) 17.5%; 5.75%.

(B) 15.0%; 5.75%.

(C) 15.0%; 7.58%.

11. Tully Advisers, Inc., has determined four possible economic scenarios and has projected the portfolio returns for two portfolios for their client under each scenario. Tully's economist has estimated the probability of each scenario as shown in the table below. Given this information, what is the expected return on Portfolio A?

Scenario	Probability	Return on Portfolio A	Return on Portfolio B
A	15%	17%	19%
B	20%	14%	18%
C	25%	12%	10%
D	40%	8%	9%

(A) 12.55%.

(B) 12.75%.

(C) 11.55%.

12. Tina O'Fahey, CFA, believes a stock's price in the next quarter depends on two factors: the direction of the overall market and whether the company's next earnings report is good or poor. The possible outcomes and some probabilities are illustrated in the tree diagram shown below:
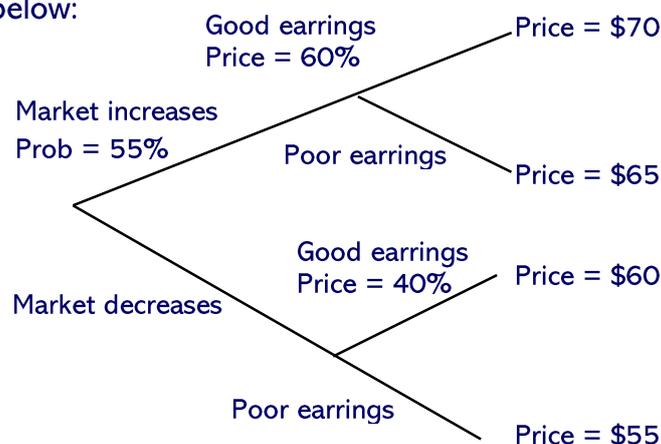
Based on this tree diagram, the expected value of the stock if the market decreases is closest to:

(A) $26.00.

(B) $62.50.

(C) $57.00

13. John purchased 60% of the stocks in a portfolio, while Andrew purchased the other 40%. Half of John's stock-picks are considered good, while a fourth of Andrew's are considered to be good. If a randomly chosen stock is a good one, what is the probability John selected it?

(A) 0.40.

(B) 0.30.

(C) 0.75.

14. A conditional expectation involves:

(A) determining the expected joint probability.

(B) calculating the conditional variance.

(C) refining a forecast because of the occurrence of some other event.

15. Use the following data to calculate the standard deviation of the return:

- 50% chance of a 12% return
- 30% chance of a 10% return
- 20% chance of a 15% return

(A) 1.7%.

(B) 2.5%.

(C) 3.0%.