Level I of the CFA® 2025 Exam

Questions - Quantitative Methods

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Q.13 A bank offers you a Certificate of Deposit (CD) with a three-year maturity with a stated annual interest rate of 8% compounded quarterly and allows you to reinvest the interests at the same rate. The worth of the CD at maturity if you invest $150,000 now is *closest to*:

A. $188,956.80

B. $189,797.85

C. $190,236.27

Q.15 Spire Bank offers to pay an investor a 10% interest payment compounded monthly. If interest payments are reinvested at 10%, the investor's future value if the initial investment is $2,000,000 for one year is *closest to*:

A. $2,200,000

B. $2,205,000

C. $2,209,426

Q.24 An investment asset offers to pay a 13% interest compounded quarterly with a maturity of 3 years. In addition, the investor has the right to reinvest the interests at the same rate of 13%. If an investor currently invests $400,000, the worth of the investment asset at maturity is *closest to*.

A. USD 577,158.80

B. USD 583,656.92

C. USD 587,138.71

Q.26 An investor wants to invest $600,000 in an asset paying a 5% interest compounded continuously for four years. The value of the investment in 4 years is *closest to*:

A. $729,303.75

B. $732,831.62

C. $732,841.65

Q.45 Consider an investment with a stated annual interest rate of 11%. The effective interest rate (EAR) using quarterly compounding for this investment is *closest to*:

A. 2.75%

B. 11.00%

C. 11.50%.

Q.128 An asset manager's portfolio had the following annual rates of return:

2012: +8%
2013: +6%
2014: -2%

What is the holding period return for this portfolio?

A. 3.91%

B. 4%

C. 12.19%

Q.219 You expect XYZ's stock to have a price of USD 142 at the end of the year. Also, you expect to receive a dividend of USD 4. How much will you pay for a stock today in order to realize a return on investment of 11%?

A. USD 144.60

B. USD 122.80

C. USD 131.50

Q.221 An investor buys 4 shares of UUA stock at $44. During the year, the company pays a $3 special dividend per share. Then, at the end of the first year, the investor buys 5 more shares at $46. Lastly, at the end of the second year, he sold all the shares for $57. If there was no dividend during the second year, what is the time-weighted rate of return of this investment?

A. 11.4%

B. 15.2%

C. 17.4%

Q.397 For an investment of ¥10,000, an institution promises to pay you a lump sum 10 years from now at a 6 % annual interest rate. The future amount you can expect if the interest is compounded monthly is *closest to*:

A. ¥ 17,908.48

B. ¥ 18,193.97

C. ¥ 18,220.29

Q.399 Chris Wright wants to save money to travel around the world. He decides to save $30,000 for a year in a bank, and the bank offers to pay him 9% compounded monthly. The future value of Mr. Wright's investment if interest payments are reinvested at 9% is *closest to*:

A. USD 32,700.00

B. USD 32,792.50

C. USD 32,814.21

Q.404 An 8% annual-coupon bond was purchased for $1,000. Exactly one year later, the bond was sold for $975. What is the investor's holding period yield if the face value of the bond is $ 1,000?

A. -2.5%

B. 5.5%

C. 8%

Q.770 Rick Hassler earned the following annual rates of return by holding shares of XYZ Inc. for a period of five years:

Year	Return (%)
2011	13
2012	19
2013	-11
2014	25
2015	30

The share's holding period return over the five-year period is *closest to*:

A. 94%.

B. 21%.

C. 14%.

Q.1303 A stock returned 2%, 9%, -3%, 13%, and x over five years. If the arithmetic mean return over the five years is 2.8%, then the fifth year return is *closest to*:

A. 10%.

B. 21%.

C. -7%.

Q.1305 Calculate the geometric mean of a fund that returned -22%, 18%, 9%, 6% and -2% in 5 years.

A. 0.83%

B. 6%

C. 18%

Q.1317 An investment grows in value from $1000 to $1352. However, the investor had invested $500 of his money and the remaining $500 was borrowed money. Assuming no interest, the return on the leveraged position is *closest to*:

A. 70%.

B. 35%.

C. 105%.

Q.1318 A portfolio return which is calculated after deducting fees from its return is called:

A. Gross return.

B. Net return.

C. Geometric return.

Q.1319 A 3-year fund returned -3%, 6% and 8% respectively. The geometric mean for this fund is *closest to*:

A. 3.55%.

B. 4%.

C. 2.78%.

Q.1320 An investor holds a stock that has been quite volatile over the past few years. The geometric mean return value will *most likely* be:

A. Higher than the arithmetic mean return value.

B. Lower than the arithmetic mean return value.

C. The same as the arithmetic mean return value.

Q.1322 Which of the following is used to measure the return on an investment over a specific period?

A. Holding period return

B. Geometric mean

C. Arithmetic mean

Q.1324 Janet Taylor purchased a single share of AMC Corp for $30 at t=0. She bought an additional unit for $42 at t=1. If at t=2 she sold both shares for $55 each, the money-weighted return of the investment is *closest to*:

A. 33.88%.

B. 31.78%.

C. 29.45%.

Q.1325 What is the exact real return of an investment which earned a yearly nominal return of 11% if the inflation during the same period was 4%?

A. 7%

B. 9.34%

C. 6.73%

Q.2670 Jane Sonam is a value investor who recently started investing in tech companies. As her financial adviser, you are given a task to calculate the money-weighted return of her investments in Solar Inc. In the beginning, Jane Sonam purchases 10 shares of Solar Inc. at $110. One year later, she purchased an additional 5 shares at $120. Assuming that the stock paid a dividend of $2 per share each year, calculate the money-weighted return if she sold all 15 shares for $122 at the end of the second year.

A. 6.31%

B. 10.58

C. 12.35%

Q.2673 A university endowment fund invests in emerging market economies to fund its research and development projects. The value of the fund's assets is provided in the following table. Assuming all cash flows occur at the beginning of the year, the time-weighted return of the fund is *closest to*:

	Year 1	Year 2	Year 3	Year 4
Beginning Value	$7,945,600	$10,750,200	$12,000,000	$9,995,000
Additional Inflow (Outflow)	$1,200,000	$850,000	($1,750,000)	$1,100,000
Ending Market Value	$10,750,200	$12,000,000	$9,995,000	$10,090,000

A. 7.7%.

B. 5.4%.

C. 1.9%.

Q.2674 An investor purchased 1,000 shares of Indian Transport Co. for INR 33.23 per share and received a dividend of INR 0.41 per share. Assuming that the investor sold the shares for INR 33.92, calculate the Holding Period Return (HPR) of the investment.

A. 1.04%

B. 3.31%

C. 10.33%

Q.2676 What is the sale price of a bond that paid a coupon of $20 and was purchased for $890, assuming that the holding period return of the bond is 4.49%?

A. $1,000

B. $910

C. $930

Q.2680 A small investor purchased 100 shares of stock HHL at $10 per share on January 4th, 2014. A year later, he purchased an additional 200 shares at $15 per share. If the investor sold all 300 shares at $17 per share on January 4th, 2016, then the annualized time-weighted return of the investment is *closest to*:

A. 27.5%.

B. 30.38%.

C. 21.11%.

Q.2835 For the past 5 year, an investor has had the following returns: 6%, 2.5%, -3%, 8%, and -6%. Which of the following statements is *most likely* accurate?

A. The geometric mean return is equal to the arithmetic return.

B. The geometric mean return is smaller than the arithmetic return.

C. The geometric mean return is greater than the arithmetic return.

Q.2836 TexCo is a textile firm in Shanghai. The stock of Tex Co has been closing higher every year for the past 7 years. Using the stock data provided in the following table, calculate the Holding Period Return on TexCo's stock for the year 2012.

Year	Closing Price	Dividend
2009	$23.78	$1.10
2010	$25.25	$1.80
2011	$28.21	$2.00
2012	$30.50	$2.50
2013	$31.50	$1.50
2014	$32.00	$3.00
2015	$34.00	$2.00

A. 19.64%

B. 18.85%

C. 16.98%

Q.2838 Which of the following return measures will *most likely* be the lowest?

A. Gross return

B. Net return

C. Pre-tax nominal return

Q.2839 An investor is interested in knowing the real return his portfolio has earned over a certain period. Assuming that the nominal return of his portfolio is 18%, the CPI is 6%, and the tax rate is 38.9%, then the real return of the portfolio is *closest to*:

A. 19.08%

B. 11.32%

C. 6.92%

Q.3404 Melvin Brown deposits $20,000 in a bank account which promises to pay an interest of 12% with quarterly compounding. The sum Brown should receive after five years is *closest* to:

A. $ 36,122.

B. $ 35,817.

C. $ 35,247.

Q.3465 The price of a stock increases from $24 to $40 in two years. The continuously compounded 2-year return for the stock is *closest* to:

A. 25.54%.

B. 28.00%.

C. 51.08%.

Q.3467 If an investor expects to earn an annual return of 10% by holding a stock, the continuously compounded annual return earned by the investor would be *closest* to:

A. 9.53%

B. 10.00%

C. 11.53%.

Q.3497 Jose Calzon currently has $5,040.11 in his bank account. If he plans to buy a car for $5,500 next year, the monthly interest rate that a bank must pay so that James receives a sum of $5,500 next year is *closest* to:

A. 0.73%.

B. 0.76%

C. 9.12%

Q.3498 A bank offers an annual interest of 12% with quarterly compounding. If the initial deposited sum is $1,011, then the sum received at the end of one year is *closest* to:

A. $1,132.32.

B. $1,135.96

C. $1,137.89

Q.3499 An investor received $100,000 after five years from a certificate of deposit which paid him an interest of 12% with monthly compounding. The sum deposited by the investor at the beginning of the 5 years is *closest* to:

A. $55,044.96.

B. $55,367.58

C. $56,742.69.

Learning Module 2: The Time Value of Money in Finance

Q.8 If you invest $100,000 currently in a project paying an 8% interest rate compounded annually, the amount of the investment after three years is *closest to*:

A. $108,000.00

B. $108,215.23

C. $125,971.20

Q.11 How much is an asset worth today, if it is supposed to pay $7,000 per year for 10 years? The first payment is due one year from now and the required rate is 6% per year.

A. $12,535.93

B. $51,520.61

C. $54,611.85

Q.19 Suppose a $200,000 investment will earn 6% compounded continuously for 4 years. The future value of this asset is *closest to:*

A. $252,495.39

B. $253,354.02

C. $254,249.83

Q.21 An asset will pay $2,500 per year for seven years, with the first payment being made one year from today. If the required rate of return is 14% per year, the amount you will pay for this asset is *closest to*:

A. $10,720.76

B. $12,221.67

C. $26,826.23

Q.22 The amount of money an investor has after ten years if they invest $25,000 per year in an index fund that pays 7% annually is *closest to*:

A. $349,178.78

B. $349,744.72

C. $345,411.20

Q.23 An index fund is projected to pay an investor a 9% annual interest for eight years. The investor intends to invest $15,000 every year, beginning next year. The total amount of money the investor will have at the end of the eight years is *closest to*:

A. $120,000.00

B. $165,427.11

C. $180,315.55

Q.25 Assume an investment asset will pay $75,000 after two years with an interest rate of 11%. The current value of the investment asset is *closest to*:

A. $60,871.70

B. $92,407.50

C. $128,439.25

Q.34 You have a choice to take your retirement benefit either as a lump-sum or as an annuity. You can take a lump-sum of $4.5 million or an annuity with 15 payments of $400,000 a year with the first payment starting t =1. The interest rate is 7% per year compounded annually. Which option is preferable, on the basis that it has the greater present value?

A. The annuity payment option.

B. The lump-sum payment option.

C. There is no significant difference between the two options.

Q.35 XYZ Pension Fund plans to pay its retirees a total of $29 million every year beginning in 2017. The payments will be made at the end of each year until 2031 for a total of 15 payments. Assuming a discount rate of 4% compounded annually, the present value of the pension payments to the retirees in 2017 is *closest to*:

A. $52,277,361.66

B. $322,433,235.50

C. $335,330,564.90

Q.37 Consider an annuity due with 20 payments of $55,000 every year with a required rate of interest of 10% compounded annually. The present value of the annuity if the first payment is due at the end of the year is *closest to*:

A. $370,012.50

B. $468,246.00

C. $566,577.67

Q.38 ABC Company Ltd has been in operation since 1966. In 2012 the company recorded revenue of $15.8 million compared to $11.4million in 2006. The revenue growth rate for the company for the six years is *closest to*:

A. -5.30%

B. 5.59%

C. 38.60%

Q.39 A Government Bond pays $2,500 per quarter year in perpetuity. If the required rate of return is 10%, price of the bond today is *closest to*:

A. $11,000

B. $25,000

C. $100,000

Q.40 Mr. Smith is planning to borrow $150,000 from ABC Bank with a 20-year fixed-rate mortgage with monthly payments, and the first payment is due in exactly one month. Mr. Smith's monthly payment if the interest rate is 7% compounded monthly is *closest to*:

A. $1,162.93

B. $1,245.02

C. $ 1,156.20

Q.42 Consider a level perpetuity of $27,000 per year, with its first payment being at the end of year seven (t = 7). Its present value today (at t = 0), given an 8% discount rate is *closest to*:

A. $124,817.75

B. $212,682.25

C. $337,500.00

Q.43 You are presented with 2 investment opportunities and must choose the one with the greater present value: A lump-sum of $2.5 million or an annuity with 25 payments of $250,000 a year with the first payment starting today. The interest rate is 9% per year compounded annually. Which one will you choose?

A. Annuity option.

B. Lump-sum.

C. Invest in both options since there's no difference between the two.

Q.44 Consider an investor with a Certificate of Deposit (CD) worth $3 million and pays a 5% interest rate compounded annually. The number of years that it will take for the CD to triple in value in *closest to*:

A. 2.9 years

B. 3 years

C. 22.5 years

Q.46 XYZ company's EPS at the beginning of each 4 consecutive years is as follows:

Year	EPS ($)
Year 1	$3.00
Year 2	$4.20
Year 3	$5.50
Year 4	$7.60

The EPS compound annual growth rate during this period is *closest to*:

A. 16.80%

B. 20.40%

C. 36.320%

Q.47 Consider a series of payments, each amounting to £6,500 is set to be received by an investor in perpetuity. Payments are to be made at the end of each year, with the first payment expected to start at the end of year 4. Suppose the discount rate is 9%, the present value of the perpetuity at $t = 0$ is *closest to*:

A. £51,164.03

B. £55,768.79

C. £72,222.20

Q.49 Consider a homeowner who wants to purchase a £230,000 home by making a down payment of £60,000 and borrowing the remainder with a 25 year fixed rate mortgage with monthly payments and the stated annual interest rate of 9% with monthly compounding. The monthly rate of mortgage repayment is *closest to*:

A. £1,267.50

B. £1,426.63

C. £1,901.30

Q.50 Suppose a Certificate of Deposit (CD) pays a 10% annual interest rate, the Effective Annual Rate (EAR) if the CD compounded monthly is *closest to*:

A. 10.30%

B. 10.40%

C. 10.50%

Q.52 Consider an investor who wants to double his £1,500,000 worth of investments. If the interest rate is 9% compounded annually, the time it will take for the value of the investment to double is *closest to*:

A. 1 year.

B. 8 years.

C. 12 years.

Q.53 GHG Corp.'s net profit increased from £2,300,000 in 2012 to £4,800,000 in 2016. The net profit growth rate is *closest to*:

A. 15.90%

B. 20.20%

C. 52.10%

Q.398 The Effective Annual Rate (EAR) of an investment with a stated annual interest rate of 33%, if the rate is compounded daily is closest to:

A. 35.70%

B. 37.30%

C. 39.10%

Q.401 The current valuation of Genius Corporation confirms a networth of AUD 2.5 million. Three years ago, the firm was sold to its new investors for AUD 800,000. The growth rate for the Genius Corporation within the three years is *closest to*:

A. 32.00%

B. 46.20%

C. 68.00%

Q.402 Mr. Thomas Newborn wants to purchase a $150,000 home and has already made a cash deposit of $20,000. The balance is financed through a 25-year mortgage borrowing with an annual interest rate of 6% compounded monthly. The first monthly mortgage payment is due at t = 1. The monthly mortgage repayment rate is *closest to*:

A. $837.59

B. $875.92

C. $966.49

Q.3403 A bank advertises that it pays an annual interest of 10% with semi-annual compounding on its savings account. The effective annual rate is *closest* to:

A. 10.25%.

B. 10.38%.

C. 10.47%.

Q.3405 Norman Smith is considering an investment opportunity presented by his portfolio manager, which involves making an annual investment of $1,000 at the end of each year for a duration of 10 years. Assuming the investment yields an annual return of 10%, the amount that Smith can expect to receive at the end of the 10th year is *closest to:*

A. $10,000.00.

B. $15,937.42.

C. $17,531.17

Q.3406 An investor wants to invest $1,000 at the beginning of each year for the next 10 years, after which he can redeem his investment at the beginning of the 10^{th} year. The amount received by the investor at the end of the 10^{th} year, if the investment generates a yearly return of 10%, is *closest* to:

A. $2,593.74

B. $15,937.42

C. $17,531.17.

Q.3407 Nathan Lewis is planning to subscribe to an investment plan which will generate a return of 5% and provide him with $2,000 at the end of each year for the next 5 years. However, due to financial constraints, he plans to subscribe to the investment plan in 2 years. The present value of the investment plan today is *closest* to:

A. $4,942.26.

B. $8,246.62

C. $8,658.95

Q.3408 A construction company is bidding for a new project. The projected cash flows of the project for the next 2 years are given in the following exhibit.

Exhibit: Projected Cash Flows

Year	Cash Flow
End of the 1st year	$100,000
End of the 2nd year	$600,000

If the company intends to generate a return of 10%, then the present value of the projected cash flows today is *closest* to:

A. $525,920.36

B. $578,512.40.

C. $586,776.86.

Q.3409 A project manager is looking to fund his new project through bank borrowings. The new project requires a funding of $1,000,000, so the manager approaches a commercial bank. The bank is willing to fund the project at an interest rate of 3% and wants the firm to pay back the entire loan in 10 years in 10 equal payments. The yearly payment required to completely pay off the loan is *closest* to:

A. $101,380.15

B. $104,171.23.

C. $117,230.51.

Q.3410 Veronica Rose borrowed $5,000 from GRF Bank. The terms and conditions of the loan are given in the following exhibit.

Exhibit: GRF Bank - $5,000 Loan

Loan	Short Term
Amount	$5,000
Tenure	3 years
Payment	3 equal payments
Rate	3%
Prepayment Penalty	Nil

If Rose decided to make a payment of $2,000 at the end of the 1st year, then the payments required for the remaining 2 years would be *closest* to:

A. $1,646.22

B. $1,676.22

C. $1,686.22

Learning Module 3: Statistical Measures of Asset Returns

Q.102 Last year, the S&P 500 has had the following returns: 2% in the first quarter, -3% in the second quarter, 5% in the third quarter, and 11% in the last quarter. The S&P 500's yearly return is *closest to*:

A. 3.63%

B. 11.00%

C. 15.31%

Q.235 Which of the following statements is *most likely* in a positively skewed distribution:

A. Mean = Median

B. Mode > Median

C. Mean > Median

Q.236 You are provided the following sample values:
{ 12, 7, 14, 11 }

The sample variance is *closest to*:

A. 5.20.

B. 6.50.

C. 8.67.

Q.410 Which one of the following statements is *most likely* accurate?

A. The geometric mean is always less than or equal to the arithmetic mean.

B. The geometric mean is always more than or equal to the arithmetic mean.

C. The geometric mean and the arithmetic mean are always equal.

Q.778 Which of the following statements is *most* accurate if two securities are perfectly correlated?

A. Risk-return opportunity set will be represented by a straight line connecting these two securities.

B. Risk-return opportunity set will be represented by a curve bulging on the left.

C. Risk-return opportunity set will be represented by a curve bulging on the right.

Q.2686 The South Korea Stock Exchange posted returns of 10% for the past fiscal year. The 10 mutual funds in the same market underperformed and overperformed the South Korean market return at different scales. The following table shows the interval of returns under and above the South Korean market return, while the returns of mutual funds are -5.75%, -3.5%, -1.7%, 0.9%, 1.2%, 2.3%, 3.2%, 5.5%, 5.8%, and 6.25%.

Interval	Values
A	(-5.75 to -2.75)
B	(-2.75 to 0.25)
C	(0.25 to 3.25)
D	(3.25 to 6.25)

Using the given data, the relative frequency of Interval C is *closest to*:

A. 30%

B. 40%

C. 70%

Q.2688 Which of the following is the *most appropriate* example of the mean of time-series data?

A. The mean annual P/E ratio in the steel sector.

B. The mean profit margin of the Fast 500 companies in 2016.

C. The quarterly mean EPS of the technology sector for the last 10 years.

Q.2689 MZJ Corp. is the market leader firm in the consultancy business. The data related to daily share price for the month of February 2015 is provided in the following table.

Date	High Price ($)	Close Price ($)
Monday, February 02, 2015	19.15	19.01
Tuesday, February 03, 2015	19.27	19.10
Wednesday, February 04, 2015	19.30	19.27
Thursday, February 05, 2015	20.10	19.50
Friday, February 06, 2015	21.00	20.75
Monday, February 09, 2015	21.00	19.80
Tuesday, February 10, 2015	20.00	18.97
Wednesday, February 11, 2015	19.00	18.50
Thursday, February 12, 2015	18.50	17.95
Friday, February 13, 2015	19.50	18.00
Monday, February 16, 2015	18.20	17.44
Tuesday, February 17, 2015	17.46	17.40
Wednesday, February 18, 2015	17.20	16.99
Thursday, February 19, 2015	18.00	17.95
Friday, February 20, 2015	19.00	18.75
Monday, February 23, 2015	20.10	19.55
Tuesday, February 24, 2015	19.60	19.55
Wednesday, February 25, 2015	21.00	20.75
Thursday, February 26, 2015	21.00	19.91
Friday, February 27, 2015	20.20	19.25

Using the given data, the arithmetic mean of the 'high price' of MZJ stock for the month of February is *closest to*:

A. $13.87.

B. $18.92.

C. $19.43.

Q.2691 The data related to the hypothetical sovereign debt rating of Latin American countries is provided below:

Country	Sovereign Debit Rating
Bolivia	BB-
Brazil	BB+
Chile	AA-
Colombia	BBB+
Costa Rica	BB
Dominican Republic	BB-
Ecuador	B
Mexico	BBB+
Panama	BBB
Peru	AA
Uruguay	BBB-
Venezuela	CCC

The data related to the sovereign debt rating is *most likely*:

A. bimodal.

B. trimodal.

C. unimodal.

Q.2693 The data pertaining to the profit margin of Gecko Inc. from 1990 to 1995 is provided in the following table.

Year	Profit Margin (%)
1990	11%
1991	15%
1992	5%
1993	9.50%
1994	15%
1995	17%

Using the given data, which of the following statements is *least likely* correct?

A. The median profit margin lies between 1992 and 1993.

B. The median profit margin of Gecko Inc. falls between 1990 and 1991.

C. The median profit margin of Gecko Inc. is more than the mean return.

Q.2694 Smith Hermes is a portfolio manager that invests in smalls cap stocks that are subject to mergers and acquisitions. The asset allocation and the return data of Smith's portfolio are provided in the following table. Using the given data, the deviation of the weighted average (mean) return from the arithmetic mean return of the portfolio will be *closest to*:

Asset	Asset Return	Asset Allocation
Solar Panel Corp.	21%	13%
Crowd fund Inc.	17.50%	24%
Peer-Loaning Co.	-11%	27%
Dimitri Bogus Ltd.	-9%	17%
Hanover Corp.	27%	19%

A. The weighted average mean deviates by -1.54%

B. The weighted average mean deviates by 7.80%

C. The weighted average mean deviates by 1.21%

Q.2696 Jennifer Hollanda is a long-term trader who purchased a Petro Co. share at the price of $50 at the beginning of the year. Assuming that the price of the share increased to $100 in Year 1, decreased to $50 in year 2, decreased to $25 in year 3 and increased to $50 in year 4, the geometric mean return of the Petro Co. share is *closest to*:

A. -50%

B. 0%

C. 100%

Q.2698 After the 2008 financial crisis, the emerging market economies have demonstrated tremendous GDP growth. The following table contains the hypothetical GDP of 10 emerging markets.

Emerging Markets	GDP (Trillion USD)
Taiwan	1.1
Thailand	1.1
Pakistan	1.3
Iran	1.4
Turkey	1.5
Saudi Arabia	1.6
Korea	1.8
Mexico	2.2
Indonesia	2.8
Brazil	3.2

Using the given data, the 60th percentile of emerging markets GDP is *closest to:*

A. USD 6.6 trillion

B. USD 2.68 trillion

C. USD 1.72 trillion

Q.2699 Muller Investments has been investing in Curex Pharma for the last 6 years. The returns of Curex Pharma's shares are provided in the following table:

Year	Returns
2001	45%
2002	29%
2003	-16%
2004	-9%
2005	13%
2006	16%

Given the information, the mean absolute deviation (MAD) of the returns of Curex Pharma over the 6-year period is *closest to*:

A. 13%

B. 17%

C. 61%

Q.2700 Muller Investments has been investing in Curex Pharma for the last 6 years. The returns of Curex Pharma's shares are provided in the following table. As an analyst, the variance of the returns is *closest to*:

Year	Returns
2001	45%
2002	29%
2003	-16%
2004	-9%
2005	13%
2006	16%

A. 5.23%

B. 13.00%

C. 17.00%

Q.2751 The continuous compounded daily return of Galata Corp's shares is given in the following table. The standard deviation of share returns during this four-day period is *closest to*:

Date	Compounded Daily Return
2-Jan-14	0.0298
15-Jan-14	0.0132
5-Feb-14	-0.0202
8-Mar-14	-0.0300

A. -0.18%

B. 2.43%

C. 5.89%

Q.3429 Which of the following is *least likely* accurate regarding frequency distributions?

A. Risk managers can use frequency distributions to find out tail events.

B. While constructing a frequency distribution, an observation can fall in more than one interval.

C. A frequency distribution can help in identifying whether the distribution is evenly distributed or lopsided.

Q.3431 Consider the following statements:

I. The geometric mean is always greater or equal to the arithmetic mean.
II. The geometric mean measures the compounded rate of return.
III. If the returns in a data set have no volatility, then the geometric mean is equal to the arithmetic mean.

Which of these statements is/are *most accurate*?

A. I, II & III.

B. I & II only.

C. II & III only.

Q.3432 The returns generated by a sample of five stocks from the Karachi Stock Exchange are given in the exhibit below.

Exhibit: Karachi Stock Exchange Returns – Sample of 5 Stocks

Stock	Return
A	12%
B	13%
C	5%
D	4%
E	20%

The standard deviation is *closest* to:

A. 5.84%

B. 6.53%

C. 10.80%

Q.3436 For a unimodal positively skewed distribution:

A. Mode < Median < Mean.

B. Median < Mode < Mean.

C. Mean < Median < Mode.

Q.3484 A research analyst has compiled the yearly returns of AZN stock in the following exhibit.

Exhibit: AZN Stock - Yearly Returns

12%	10%	4%	16%	18%	15%	25%	20%

The second quartile of the distribution of returns is *closest* to:

A. 15%

B. 15.50%.

C. 16%.

Q.3485 The annual returns of a fund of funds is given in the exhibit below.

Exhibit: Annual Returns - Fund of Funds

Portfolio	Annual Return
Fund A	12%
Fund B	15%
Fund C	-5%
Fund D	5%

The mean absolute deviation (MAD) of the returns generated by the four funds is *closest* to:

A. 5.25%

B. 6.75%.

C. 11.75%

Q.3486 A leptokurtic distribution is *most likely* defined as:

A. more peaked than a normal distribution.

B. a less peaked than a normal distribution.

C. similarly peaked to a normal distribution.

Q.3504 If a security has a mean expected return of 7% and a standard deviation of 0.005, its coefficient of variation is *closest* to:

A. 0.00035.

B. 0.0714.

C. 14.

Q.3505 Which of the following statements is *most* accurate?
Skewness refers to the extent the distribution is:

A. symmetrical. In negatively skewed distributions, the mean is to the left of the peak.

B. non-symmetrical. In the left-skewed distribution, the mean is to the left of the peak.

C. non-symmetrical. In negatively skewed distributions, the mean is to the right of the peak.

Q.3506 An equity analyst’s performance measurement is linked with its historical returns generated by his investment decisions. The *best* way to measure the returns is the:

A. geometric mean.

B. arithmetic mean.

C. Both will provide the same result.

Q.3721 Which of the following best describes the concept of skewness in statistics?

A. The degree to which a distribution is symmetric about its mean.

B. The degree to which a distribution is nonsymmetric about its mean.

C. The degree to which a distribution is nonsymmetric about its median.

Q.3722 Which of the following statements is *least* accurate about kurtosis?

A. Excess kurtosis that's positive indicates a leptokurtic distribution.

B. Excess kurtosis that's negative indicates a platykurtic distribution.

C. Excess kurtosis is a measure relative to the normal distribution, which has a kurtosis of 1.

Q.3723 Mary Noel, CFA, is tasked with analyzing the returns of two different assets – A and B. She finds that the two assets have the same mean, variance, and skewness, but A has a higher kurtosis than B. Which of the following statements is *most likely* true?

A. Asset B is riskier than asset A.

B. Asset A is riskier than asset B.

C. We cannot conclude anything based on the given information.

Q.3736 At a certain investment firm, each of the firm's 5 managers is tasked with overseeing a project. During a given one-year period, the managers reported the following individual returns from their projects:
[24%, 26%, 30%, 18%, 20%]

The population variance of these returns is *closest to*:

A. 0.182%.

B. 0.228%.

C. 0.236%.

Q.3987 Consider the following annual returns of a stock for a period of 10 years:
{ 15%, 17%, 12.5%, 16%, 13.6%, 19%, 14.6%, 10%, 11%, 16% } The population mean is *closest to*:

A. 14.47%.

B. 14.80%.

C. 14.82%.

Q.3988 In kurtosis, the distribution that has thinner tails than the normal distribution is *best described* as:

A. leptokurtic.

B. mesokurtic.

C. platykurtic.

Q.3989 Given two variables, X and Y, variable X has a mean of -0.87, with variable Y having a mean of 0.46, and a negative covariance exists between the two variables. The correlation between variables X and Y is *most likely* :

A. zero.

B. negative.

C. positive.

Q.3991 Consider the following returns of a portfolio.

Month	Return (%)
Jan	6
Feb	4
Mar	−2
Apr	−5

The target downside deviation when the target return is 4% is *closest* to:

A. 6.24%

B. 7.51%

C. 8.66%

Learning Module 4: Probability Trees and Conditional Expectations

Q.300 An investor owns shares of both Apple and Microsoft. He assumes that the probability of Apple's share price declining by more than 5% this year is 0.4, while the probability of Microsoft's share price declining by more than 5% is 0.3. The probability that either Apple or Microsoft's share prices will decline in price by more than 5% this year is *closest to*;

A. 0.12

B. 0.58

C. 0.70

Q.310 Suppose A and B are mutually exclusive events, and P(A)=0.2, P(B)=0.5. The probability P(A and B) is *closest to*:

A. 0

B. 0.01

C. 0.7

Q.313 You own shares of Corp. A and Corp.B. You think that the probability of Corp. A to go bankrupt this year is 0.15, and Corp.B to go bankrupt is 0.25. The companies going bankrupt are independent of each other. The probability that at least one of these two companies will go bankrupt this year is *closest to*

A. 0.0375

B. 0.3625

C. 0.4

Q.412 There is a 40% chance that the economy keeps sinking into recession next year and a 60% chance that it will rebound. If the economy rebounds, Company ABC will hire 2,000 employees. If the economy keeps sinking, there is an 80% probability that it will cut 1,000 jobs and a 20% chance to go bankrupt and cut 9,000 jobs. The firm's expected job hires/cut is *closest to*:

A. -2,600 employees

B. +160 employees

C. +2,000 employees

Q.415 You have been given the following probabilities:

P(A) = 35%
P(B) = 65%
P(B | A) = 65%
The probability that Event A and Event B occur is *closest to*:

A. 22.75%

B. 35%

C. 65%

Q.2714 Which of the following is the *most appropriate* term used for events that cover all the possible outcomes?

A. Exhaustive events.

B. Independent events.

C. Mutually exclusive events.

Q.2715 If the probability that students use preparation materials for the CFA Level 1 exam is 80% and the probability that the students will pass the CFA Level 1 exam given that they use preparation materials is 54%, then the joint probability of using preparation materials and passing the CFA Level 1 exam is *closest to:*

A. 43.2%

B. 80.0%

C. 90.8%

Q.2716 The probability that the Eurozone economy will grow this year is 48%, and the probability that the European Central Bank (ECB) will loosen its monetary policy is 50%. Assuming that the joint probability that the Eurozone economy will grow and the ECB will loosen its monetary policy is 40%, then the probability that either the Eurozone economy will grow or the ECB will loosen its the monetary policy is *closest to*:

A. 40%.

B. 48%.

C. 58%.

Q.2717 Which of the following statements regarding the probability rules is *least likely* accurate?

A. Joint probability: p(X|Y) * p(Y)

B. Addition rule : p(T) + p(U) - p(TU)

C. For independent events: p(K|L) = p(L)

Q.2718 A company which produces 5G communication equipment has two factories, A and B. 40% of the equipment are made in factory A, 60% in factory B. It has been established that 90% of the equipment produced by factory A meets specifications while only 75% of the equipment produced by factory B meets specifications. If a Telco buys the equipment, the probability that it meets specifications is *closest to*:

A. 0.40

B. 0.76

C. 0.81

Q.2720 An analyst at Hampton Investments Company is calculating the expected value dividend to be received on Healthcare Co. shares.

Analysts	Dividend Forecast	Probability
PICO	$1.80	0.27
Stock Ninja	$8.60	0.10
Hermes Smith	$5.00	0.09
John Kenen	$2.22	0.35
Hira Ahmed	$0.95	0.19

As an analyst, using the forecasts of different analysts and their probabilities given in the following table, the estimated value of Healthcare's dividend is *closest to*:

A. $0.55

B. $0.86

C. $2.75

Q.2721 If event C and event D are mutually exclusive, then which of the following statements is the *least likely* appropriate?

A. Event D could not occur.

B. Only event C could occur.

C. Event C and D could occur together.

Q.2722 Assume you are a financial analyst at an investment management firm where you're given the task to estimate the dispersion of a specific equity price around its forecasted value.

Probability	Equity Value
0.33	$62.15
0.39	$60.75
0.28	$63.00

As a financial analyst, the variance of equity value using the data provided in the following table is *closest to:*

A. 0.495

B. 0.872

C. 0.934

Q.2723 Assume you are an associate at an investment management firm where you're given the task to estimate the dispersion of a specific equity price around its forecasted value. The forecasted values and probabilities associated with them are given in the following table:

Probability	Equity Value
0.33	$62.15
0.39	$60.75
0.28	$63.00

Using the given data, the standard deviation is *closest to*:

A. 0.50

B. 0.87

C. 0.93

Q.2724 Suppose there is a 65% probability that the Gross Domestic Product (GDP) of Trivia Land will grow this year. If the GDP grows, there is a 75% probability that the GDP will be $5.5 trillion and a 25% probability that the GDP will be $5.1 trillion. On the other hand, there is a 35% probability that the GDP will fall, and if it falls, there is a 55% probability that the GDP will be $4.7 trillion and only a 45% probability that the GDP will be $4.0 trillion.
Using the given assumptions, the unconditional probability that the expected GDP will be $4.0 trillion is *closest to*:

A. 15.75%

B. 35%

C. 45%

Q.2725 Suppose there is a 65% probability that the Gross Domestic Product (GDP) of Trivia Land will grow this year. If the GDP grows, there is a 75% probability that the GDP will be $5.5 trillion and a 25% probability that the GDP will be $5.1 trillion. On another hand, there is a 35% probability that the GDP will fall, and if it falls, there is a 55% probability that the GDP will be $4.7 trillion and only a 45% probability that the GDP will be $4.0 trillion. Using the given assumptions the expected GDP of Trivia Land given that the GDP will grow is *closest*:

A. $5.40 trillion

B. $5.10 trillion

C. $5.50 trillion

Q.2727 Suppose there is a 65% probability that the Gross Domestic Product (GDP) of Trivia Land will grow this year. If the GDP grows, there is a 75% probability that the GDP will be $5.5 trillion and a 25% probability that the GDP will be $5.1 trillion. On the other hand, there is a 35% probability that the GDP will fall, and if it falls, there is a 55% probability that the GDP will be $4.7 trillion and only a 45% probability that the GDP will be $4.0 trillion. Using the given assumptions, the conditional variance of GDP in the environment where the GDP is expected to grow is *closest to*:

A. 0.03

B. 0.04

C. 0.173

Q.3438 At the University of Alabama, a portfolio management test has ten questions, and each question has four option choices, out of which only one is correct. James Sigh selects a random option for each of the ten questions. The probability that all his answers are correct is *closest to*:

A. $(\frac{1}{4})^{10}$

B. $(\frac{1}{10})^{4}$

C. $\frac{1}{4}$

Q.3445 Box A contains 20 red balls, while Box B contains 10 white balls. A box is randomly selected, and a ball is drawn out. The probability that the ball is white is *closest* to:

A. 0.33.

B. 0.50.

C. 0.67.

Q.3451 Three events (A, B, and C) are independent of each other. The probability of occurrences of each event is 0.30, 0.25, and 0.20, respectively. The probability that all the events occur simultaneously is *closest* to:

A. 0.015

B. 0.735

C. 0.750

Q.3452 An equity analyst tracks a stock and has forecasted the price of stocks under various conditions, as given in the following exhibit.

Exhibit: Stock price given different events - March 2016

Event	Probability
The stock index rises	40%
The stock index falls	60%
The price of the stock increases given that the stock index rises	20%
The price of the stock increases	40%

Given that the stock index fell in March 2016, the probability that the price of the stock increased is *closest* to:

A. 0.20

B. 0.53

C. 0.60

Q.3456 The research team of an investment bank makes the following predictions:

Rate cut by the central bank
Probability (60%)

Sub Event	Probability
Stock market rises	70%
Stock market falls	30%

No rate cut by the central bank
Probability (40%)

Sub Event	Probability
Stock market rises	40%
Stock market falls	60%

The probability that the stock market will rise, irrespective of a rate cut or not, is *closest* to:

A. 42%.

B. 58%.

C. 82%.

Q.3459 A portfolio manager has the mandate of creating portfolios by including two pharmaceutical stocks and one engineering stock. If the portfolio manager has the option to select from ten pharmaceutical and four engineering stocks, respectively, then the maximum number of portfolios that can be created is *closest* to:

A. 180

B. 270

C. 360

Q.3463 An equity research analyst forecasts the share price of Equidor Inc.’s stock and the probability of achieving the price target. The forecast made by the analyst is given in the following exhibit.

Exhibit 1: Share Price Forecast

Probability	Share Price
20%	$32.00
25%	$28.00
40%	$34.00
15%	$40.00

The variance of Equidor Inc.’s stock price is *closest* to:

A. 3.77

B. 14.20.

C. 33.00

Q.3488 The probabilities that Bond A and Bond X will default in the next two years are 10% and 8%, respectively. The probability that both bonds will default simultaneously in the next two years is 5%. The probability that Bond A will default given that Bond X has already defaulted is *closest to*:

A. 10%

B. 17.2%

C. 62.5%

Q.3508 An analyst covers the international bonds market. The probability that Italy defaults and Japan defaults are 0.01 and 0.02, respectively. Both events are independent of each other. The probability that Italy defaults given that Japan has already defaulted is *closest* to:

A. 0.01.

B. 0.03

C. 0.118

Q.3509 An analyst covers two companies – Xela Ltd. and Yena Inc. Yena Inc. is a subsidiary of Xela. The probability that the return on equity (ROE) of Xela exceeds 20% this year is 0.10, while the probability that the ROE of Yena exceeds 30% is 0.05 for the same time period. If the probability that the ROE of Xela exceeds 20% and the ROE of Yena exceeds 30% is 0.02, then the probability that the ROE of Yena exceeds 30% given that the ROE of Xela has already exceeded 20% is *closest* to:

A. 0.05

B. 0.10.

C. 0.20

Q.3715 An empirical study of ABC stock listed on the New York Exchange reveals that the stock has closed higher on one-third of all days in the past few months. Given that up and down days are independent, the probability of ABC stock closing higher for six consecutive days is *closest to*:

A. 0.00137.

B. 0.088.

C. 0.776.

Q.3716 A fruit juice shop allows customers to choose apple juice, mango juice or passion juice. The probability of a customer ordering passion juice is 0.45, mango juice and apple juice 0.19, passion juice and mango juice 0.15, passion juice and apple juice 0.25, passion juice or mango juice 0.6, passion juice or apple juice 0.84, and 0.9 for at least one of them.
The probability that a customer orders all three juices is *closest to*:

A. 0.10

B. 0.30

C. 0.64

Q.3729 The punctuality of filing tax returns has been investigated by considering the number of citizens in different geographical regions. In the sample, 60% of respondents were from Africa, 20% Europe, and 20% South America. The probabilities of late filing of returns in Africa, Europe, and South America are 45%, 15%, and 20% respectively.
If a late submitter is picked at random from the area under study, the probability that they are from Africa is *closest to*

A. 0.45

B. 0.7941

C. 0.80

Q.3732 An investment firm classifies capital projects into three different categories, depending on risk level: Standard, Preferred, and Ultra-preferred. Of the firm's projects, 60% are standard, 30% are preferred, and 10% are ultra-preferred. The probabilities of a project making a loss are 0.01, 0.005, and 0.001 for categories standard, preferred, and ultra-preferred respectively.
If a capital project makes a loss in the next year, the probability that the project was standard is *closest to*;

A. 79%

B. 72%

C. 78%

Q.3733 Upon arrival at a cancer treatment center, patients are categorized into one of four stages namely: stage 1, stage 2, stage 3, and stage 4. In the past year,
i. 10% of patients arriving were in stage 1
ii. 40% of patients arriving were in stage 2
iii. 30% of patients arriving were in stage 3
iv. The rest of the patients were in stage 4
v. 10% of stage 1 patients died
vi. 20% of stage 2 patients died
vii. 30% of stage 3 patients died
viii. 50% of stage 4 patient died

Of the patients who survived, the probability that they arrived in stage 4 is *closest to*:

A. 13%

B. 14%

C. 12%

Q.3734 You are an analyst at a large mutual fund. After examining historical data, you establish that all fund managers fall into 2 categories: superstars (S) and ordinaries (O).
Superstars are by far the best managers. The probability that a superstar will beat the market in any given year stands at 70%. Ordinaries, on the other hand, are just as likely to beat the market as they are to underperform it. Regardless of the category in which a manager falls, the probability of beating the market is independent of year to year. Superstars are rare diamonds because only a meager 16% of all recruits turn out to be superstars.

During the analysis, you stumble upon the profile of a manager recruited 3 years ago, who has since gone on to beat the market every year.

The probability that the manager is a superstar is *closest to*:

A. 46%

B. 34%

C. 84%

Q.3735 A human health organization tracked a group of individuals for 5 years. At the commencement of the study, 25% were categorized as heavy smokers, 40% as light smokers and the remaining as nonsmokers. Results revealed that light smokers were twice as likely as nonsmokers to die during the half-decade study, but only half as likely as heavy smokers. During the period, a randomly selected group member passed on.
The probability that the individual who died was a heavy smoker is *closest to*:

A. 0.19.

B. 0.53.

C. 0.47.

Q.3819 The amount of the annual dividend paid by ART Enterprises to its shareholders depends on the profits available for distribution. There is a 30% probability that the company will generate profits less than $50,000. If the company generates less than $50,000, there is a 15% chance of the company paying a $3 dividend. There is a 70% probability that profits will exceed $50,000 and the company will pay a dividend per share of $6 with a probability of 45%. The expected dividend payment, given ART Enterprises generates profits of less than $50,000, is *closest to:*

A. 0.189

B. 0.45

C. 3

Q.3821 Lance Thackery is an equity analyst at Eve Scott Associates. Thackery is following the stock of a pharmaceutical company. She is attempting to analyze whether the upcoming launch of a Type-I diabetic drug will be successful and increase the market price of the pharmaceutical's share. The probability that the stock price will increase given a successful drug launch, P (A|S), is 0.35. Thackery has summarized important forecast probabilities in the exhibit below:

	Probability
Probability stock price increases	0.40
Probability stock price is unchanged	0.60
Probability drug launch is successful	0.45
Probability drug launch is unsuccessful	0.55

The probability that the stock price increases, given that the drug launch is unsuccessful, is *closest to:*

A. 0.44

B. 0.40

C. 0.55

Q.3826 A financial risk manager has three routes to get to the office. The probability that she gets to the office on time using routes X, Y, and Z are 60%, 65%, and 70%. She does not have a preferred route and is therefore equally likely to choose any of the three routes. Given that she arrives to work on time, the probability that she chose route Z is *closest to:*

A. 0.36

B. 0.56

C. 0.52

Learning Module 5: Portfolio Mathematics

Q.301 Which of the following statements is *most accurate* ?

A. Correlation cannot be zero.

B. Covariance is always positive.

C. Correlation cannot be greater than 1.

Q.308 Thirty percent of the stocks in your portfolio have a P/E ratio greater than 15, out of which 25% are in the technology industry. The probability that a randomly selected stock from the portfolio will have a P/E greater than 15 and be in the technology industry is *closest to*:

A. 0.075

B. 0.30

C. 0.475

Q.2719 If the probability that Donald Trump will lose the Presidential elections is 52% and the probability that the USD will devalue given that Trump wins the election is 91%, then the joint probability of Trump winning the Presidential elections and the devaluation of the USD is *closest to*:

A. 0.4368

B. 0.4730

C. 0.9530

Q.2728 Which of the following properties of covariance is *least likely* appropriate?

A. Covariance ranges from -1 to +1.

B. Covariance of (R,R) = Variance of R

C. Covariance measures how one random variable moves with another random variable.

Q.2730 Assuming that the covariance of returns of Stock X and Stock Y is Cov(RX, RY) = 0.093, the variance of RX = 0.69, and the variance of RY = 0.36, the correlation of returns of Stock X and Stock Y is *closest to*:

A. 0.112

B. 0.155

C. 0.187

Q.2743 A young investor consults an investment manager to advise him regarding a certain type of the portfolios which give him at least 7% of return on his investment (threshold return). The investment manager presents three portfolios exhibited in the following table. Assuming that the investor invests in portfolio B, then the probability of the portfolio return falling below the threshold return of 7% according to the Safety-First ratio is *closest to*:

	Portfolio A	Portfolio B	Portfolio C
Expected Return	19%	23%	36%
Standard Deviation	14%	26%	39%

(See Z-table)

A. 27%.

B. 61.5%.

C. 73%.

Q.2744 An investor consults an investment manager to advise him regarding a certain type of the portfolios which would give him at least a 7% return on his investment (threshold return). The investment manager presents three portfolios exhibited in the following table:

	Portfolio A	Portfolio B	Portfolio C
Expected Return	19%	23%	36%
Standard Deviation	14%	26%	39%

Using the Safety-First ratio assumption, the portfolio that is the *most appropriate* for the investor is:
(See Z-table)

A. Portfolio A.

B. Portfolio B.

C. Portfolio C.

Q.3307 The exhibit below summarizes risk, return, and fee data for three market-neutral hedge funds:

Exhibit: Risk, Return and Fee Data

	Fund A	Fund B	Fund C
Risk-free rate	2%	2%	2%
Annualized return	15%	22%	9%
Annualized standard deviation	20%	26%	15%
Fees	1.0 and 10	1.5 and 15	2.0 and 20

Which of the following funds is most suitable for investments?

A. Fund A

B. Fund B

C. Fund C

Q.3455 Rohan Chatterjee is planning to invest in mutual funds. His sole instruction to his portfolio manager is to generate a minimum return of 5%. The mutual funds in which the portfolio manager can invest are given in the following exhibit.

Exhibit: Potential Mutual Funds

Mutual Fund	Mean Return	Std. Dev. of Return
X	10%	3%
Y	12%	4%
Z	9%	2%

The portfolio manager will *most likely* invest in:

A. X

B. Y

C. Z

Q.3457 The covariance matrix of two stocks is given in the following exhibit.

Exhibit: Covariance Matrix

Stock	X	Y
X	650	120
Y	120	450

The correlation of returns for stocks X and Y is *closest* to:

A. 0.22

B. 0.45

C. 0.83

Q.3458 A portfolio consists of two funds A and B. The weights of the two funds in the portfolio and the covariance matrix of the two funds are given in the following two exhibits.

Exhibit 1: Weight of the Funds in the Portfolio

Fund	A	B
Weights	60%	40%

Exhibit 2: Covariance Matrix

Fund	A	B
A	700	200
B	200	500

The portfolio variance is *closest* to:

A. 200.00

B. 428.04

C. 500.00

Q.3714 The probability of an increase in the annual dividend paid out to shareholders of ABC Limited is 0.4. The probability of an increase in share price given an increase in dividends is 0.7. The joint probability of an increase in dividends and an increase in share price is *closest to*:

A. 0.28.

B. 0.70.

C. 0.82.

Q.3718 A renowned economist has calculated that the Canadian economy will be in one of 3 possible states in the coming year: Boom, Normal, or Slow. The following table gives the returns of stocks A and B under each economic state.

State	Probability (state)	Return for stock A	Return for stock B
Boom	40%	12%	18%
Normal	35%	10%	15%
Slow	25%	8%	12%

The covariance of the returns for stocks A and B is *closest to*:

A. 0.0003765

B. 0.103

C. 0.1545

Q.3719 Which of the following statements is *least likely* true regarding the correlation coefficient?

A. The correlation coefficient has no units.

B. The correlation coefficient ranges from 0 to +1.

C. The correlation coefficient measures the strength of the linear relationship between two random variables.

Q.3724 Two stocks, X and Y, have a correlation of 0.50. Stock Y's return has a standard deviation of 0.26. Given that the covariance between X and Y is 0.005, the variance of returns for stock X is *closest to*:

A. 0.00148

B. 0.0385

C. 0.26

Q.4022 Consider the following two stocks from different portfolios;

	Stock A	Stock B
Expected Return	6%	10%
Standard Deviation	7%	14%
Current Portfolio weights	0.3	0.7

Given the correlation between the two stocks returns is 0.40, the covariance between the returns of Stock A and B is *closest to*:

A. 0.0024

B. 0.0039

C. 0.0088

Q.3512 Which of the following statements is *most accurate*? Lognormal Distributions are:

A. skewed to the right.

B. skewed to the left and often used to model asset prices.

C. skewed to the left and rarely used to model asset prices.

Q.4023 Which of the following is *least likely* a parameter of lognormal distribution;

A. Mean.

B. Median.

C. Standard deviation.

Q.4592 The monthly closing prices of ApexTech Corporation shares are as follows:

Date	Closing Price (USD)
30 June	105
31 July	120
31 August	130

The continuous compounded return of ApexTech Corporation shares for the period from June 30 to August 31 is closest to:

A. 10.58 percent.

B. 10.68 percent.

C. 21.36 percent.

Q.4593 In financial modeling, the lognormal distribution is often preferred over the normal distribution for representing asset prices primarily because asset prices are:

A. Non-decreasing.

B. Without upper limits.

C. Positively constrained.

Q.4594 Consider a random variable Y that is distributed according to a lognormal distribution. Which of the following statements is most accurate regarding the relationship between Y and its natural logarithm, ln(Y)?

A. If Y is lognormally distributed, then ln(Y) follows a uniform distribution.

B. If ln(Y) is normally distributed, then Y cannot be lognormally distributed.

C. If ln(Y) is normally distributed, then Y is lognormally distributed.

Q.4596 Which of the following statements *best* explains why the lognormal distribution is commonly used to model asset prices in financial markets?

A. The lognormal distribution is symmetric and can model asset prices that can take on negative values.

B. The lognormal distribution has a lower bound at zero, making it suitable for modeling asset prices that cannot be negative.

C. When the continuously compounded returns on a stock are normally distributed, the stock prices are also normally distributed.

Q.4597 Which of the following is an *appropriate* application of Monte Carlo simulation in financial modeling?

A. Providing exact valuations for call options without any further analysis.

B. Evaluating the impact of varying assumptions on a model, such as the distribution of critical variables.

C. Generating a series of returns based on historical data patterns.

Q.4598 XYZ Corporation is evaluating a new investment project using Monte Carlo simulation. The finance team has constructed a model to simulate the project's potential returns under various scenarios. However, they are concerned about the limitations of this approach. Which of the following is ***most likely*** a limitation of the Monte Carlo simulation used by XYZ Corporation?

A. Only provides statistical estimates of results, not exact figures.

B. Inability to conduct scenario analysis.

C. Dependence on historical return data.

Q.4599 Consider the following statements made by Tom, Anna, and Fiona regarding the concept of Monte Carlo simulation as used in financial modeling. **Tom:** A probabilistic approach that employs random sampling to generate a range of possible outcomes and assesses their likelihood in uncertain environments. **Anna:** A deterministic method that relies on fixed inputs to forecast future financial outcomes with certainty. **Fiona:** A statistical technique that uses random sampling and historical data to predict the behavior of financial markets. Based on the statements provided, who ***best*** describes the concept of Monte Carlo simulation as used in financial modeling?

A. Tom

B. Anna

C. Fiona

Q.4600 Which of the following is ***least likely*** a use of Monte Carlo simulation in valuing a lookback contingent claim?

A. Generating a large number of possible paths for the underlying asset price over the life of the option.

B. Calculating the average of all the discounted payoffs from the simulated paths to estimate the fair value of the claim.

C. Using historical asset price data to determine the exact payoff of the lookback option at expiration.

Q.4602 Which of the following statements ***best*** describes the purpose of resampling in statistical analysis?

A. Resampling involves repeatedly using the same sample to test different hypotheses without making any statistical inferences about the population.

B. Resampling is a method used exclusively for estimating the mean of a population by drawing multiple samples from the observed data.

C. Resampling entails repeatedly drawing samples from the original observed sample to make statistical inferences about population parameters.

Q.4603 Which of the following statements is ***most accurate***? Bootstrap resampling technique:

A. treats the initial sample as a stand-in for the entire population, allowing for the creation of a sampling distribution through repeated resampling.

B. requires conventional analytical formulas like z-statistics to create a sampling distribution for statistical inferences.

C. information about the population is essential to mimic the process of drawing samples from the population.

Q.4604 Which of the following statements ***best*** distinguishes between the Bootstrap and Monte Carlo simulation techniques?

A. Both techniques use repetitive sampling for statistical inferences but differ in their data generation and usage approaches.

B. Monte Carlo uses the dataset as a proxy for the population, whereas Bootstrap resampling requires pre-determined parameter distributions.

C. Monte Carlo simulation needs many observations for accurate population simulation, whereas Bootstrap can effectively handle smaller datasets.

Q.4605 In the process of bootstrapping, analysts:

A. are required to define probability distributions for crucial risk factors influencing the underlying random variables.

B. continuously draw samples of identical size, with replacement, from the initial population.

C. aim to derive statistical estimates of population parameters using a singular sample.

Q.4606 Which of the following ***accurately*** describes an advantage of the bootstrapping method? Bootstrapping:

A. yields precise outcomes for population parameters.

B. is intricate and demands comprehensive statistical expertise.

C. can emulate sampling from the population by utilizing the observed.

Learning Module 7: Estimation and Inference

Q.422 Which statistic is *most likely* to be used for a limited normal sample size (less than 30) with an unknown variance?

A. t-test.

B. z-test.

C. The sample size is too small to make any kind of judgment.

Q.424 A distribution has a mean of 11% and a standard deviation of 20%. The interval of this distribution using a 95% confidence interval is *closest to*;

A. -9% to 31%.

B. -28.2% to 50.2%.

C. -21.9% to 43.9%.

Q.993 The *most likely* outcome of an increase in sample size is:

A. the sample standard deviation increases.

B. the sample mean gets closer to the population mean.

C. the sample mean varies from the population mean to a large extent.

Q.996 As the degrees of freedom increases and the t-statistic approaches towards the z-statistic, the tails of the distribution *most likely* become:

A. thicker.

B. thinner.

C. unchanged.

Q.1877 The *most accurate* definition of a sample error is the:

A. estimation error created by using a non-random sample.

B. difference between a sample statistic and its corresponding population parameter.

C. difference between the point estimate of the mean and the mean of the sampling distribution.

Q.1879 The Central Limit Theorem is *most appropriately* concerned with the sampling distribution of the:

A. sample mean.

B. population mean.

C. sample standard deviation.

Q.1884 The following information is available on a sample of advertising budgets taken from 81 U.S companies:

- The mean advertising budget is 10 million.
- The sample variance is 36 million.

The standard error of the sample mean is *closest to*:

A. 0.667.

B. 1,667.

C. 11,384

Q.2752 Which of the following is the *most appropriate* example of a simple random sample?

A. An analyst randomly selects AAA-rated corporate bonds as a sample to estimate the default risk of the U.S. Bond market.

B. An analyst randomly selects large-cap index stocks from the Mumbai Stock Exchange to measure the holding period return of Indian stocks.

C. An analyst randomly selects the GDP growth rate of five random countries from the European Union to measure the GDP growth of European Union countries.

Q.2753 A survey team in Srilanka conducted a health survey in a village by dividing the village population into three different age ranges. The first range consisted of the population aged between 0 to 20 years, the second range was of the population above 20 years and below 45 years, and the last range was comprised of all the villagers above 45 years of age. A sample was drawn from each range according to the proportion of that range. The results showed that the healthiest people were between the ages of 0 and 20 years. The *most likely* type of sampling technique used by the survey team is;

A. simple random sampling.

B. stratified random sampling.

C. systematic random sampling.

Q.2754 Bogotara is a hypothetical country whose bond market is composed of 2,000 corporate and government bonds. An analyst interested in investing in Bagotara's bond market calculated the mean return of 11.09% based on the sample of 200 bonds, while the population mean return of Bagotara's bond market is only 9.89%. Which of the following errors is *most likely* related to the analyst's estimation?

A. Mean error.

B. Sampling error.

C. Standard deviation.

Q.2755 An analyst is given the financial statements of the top five firms in the logistics sector to conduct a cross-sectional analysis. Which of the following methods is *most appropriate* for cross-sectional data analysis?

A. The analyst should compare the profit margin of each of the five firms within the sector.

B. The analyst should compare the returns of each of the five firms with their historical returns.

C. The analyst should use the EPS of the last 5 years of any firm to estimate the growth in the sector.

Q.2757 Which of the following is *least likely* a property of the central limit theorem?

A. The variance of distributions of the sample mean is calculated as $\frac{\sigma^2}{\sqrt{n}}$.

B. The mean of the population and the mean of all of the distributions of the sample's means are equal.

C. If the sample size is equal to or larger than 30, we can assume that the sample mean is normally distributed.

Q.2758 Which of the following is the *most appropriate* definition of the standard error of the sample mean?

A. The variance of the distribution of the sample mean.

B. The standard deviation of the distribution of the sample means.

C. Difference between the population mean and the sample mean.

Q.2759 The mean return on the stocks of automotive companies is $26.5, while the sample standard deviation of 36 automotive companies is $3.1. The standard error of the sample mean is *closest to*:

A. $0.52

B. $0.60

C. $0.74

Q.2761 The mean of a population of 1,000 observations is 61. If the mean and the variance of a sample of 225 observations are 49 and 25 respectively, then the standard error of the sample mean is *closest to*:

A. 0.33.

B. 0.46

C. 0.71

Q.2767 Which of the following is *least likely* an example of out-of-sample testing?

A. An analyst developed a model to measure the risk of small-cap equity stocks. The model is then applied to large-cap stocks to measure their significance level.

B. An analyst developed a return model based on the S&P 500 daily index from January 1st, 2015 to March 30th, 2015. He then applies the model on data collected between April 1st, 2015, and May 15th, 2015 to test its significance.

C. An analyst developed a model to forecast bond yield variations based on weekly yield variations in 10-year U.S. bonds for the first quarter of 2009 to the fourth quarter of 2011. To test its significance, the model was then applied to yield variations from the third quarter of 2010 to the second quarter of 2011.

Q.3468 A researcher wants to conduct a study to determine the level of literacy in his country. He randomly selects a few universities and conducts a survey among the school students. With respect to his study, the sampling can be *best described* as:

A. systematic sampling.

B. simple random sampling.

C. stratified random sampling.

Q.3469 Which of the following is the *most accurate* statement regarding the central limit theorem? From a population with mean and a finite variance:

A. the sample mean approaches a normal distribution for systematic random samples of size n for $n < 30$.

B. the sample mean approaches a normal distribution for systematic random samples of size n as n becomes larger.

C. the sample mean approaches a normal distribution for simple random samples of size n as n becomes larger.

Q.3470 Large random samples of size *n* are repeatedly taken from a large population. Thereafter, the mean of the random samples is taken to create a distribution. If the population mean is μ, then the mean of the distribution created by computing the mean of the random sample will *most likely* be:

A. $n\mu$

B. $\frac{\mu^2}{n}$

C. μ

Q.3475 An equity research analyst wants to create an index that contains an equal representation of each segment of the market. The *most appropriate* sampling method to create the index is:

A. stratified sampling.

B. systematic sampling.

C. simple random sampling.

Q.3737 The mean hourly wage for coal workers in the U.S. is $15.5 with a population standard deviation of $3.2. If the sample size is 30, the standard error of the sample mean is *closest to*:

A. 0.206

B. 0.584

C. 0.813

Q.3744 A population has a known mean of 100. Suppose 36 samples are randomly drawn from this population with replacement. The observed mean is 97.8 and the standard deviation is 10. The standard error of the sample mean is *closest to*:

A. 0.360

B. 1.011

C. 1.667

Q.4024 XYZ Associates, a qualified audit firm, wants to audit the books of accounts for ABC Ltd for the financial year 2021. During their fieldwork, XYZ discovered that ABC Ltd had a significant number of financial transactions in their books. Due to time constraints, XYZ couldn't audit all the transactions. To manage this, XYZ Audit Firm employed a sampling technique that allowed them to make a practical and informed selection of transactions to audit, acknowledging that the technique might introduce some bias but still provide valuable insights.

A. Cluster sampling.

B. Judgemental sampling.

C. Convenience sampling.

Q.423 Which statistic should you use to *most appropriately* compare two population variances with a sample size smaller than 30?

A. z-test.

B. t-test.

C. F-test.

Q.425 Which of the following statements is *least accurate*?

A. A 1% significance level is the same as a 99% confidence.

B. The alternative hypothesis (H_a) always includes an equal sign.

C. The alternative hypothesis (H_a) is usually the hypothesis which we are trying to assess.

Q.1110 Which of the following statements is *most accurate*?

A. The null hypothesis is the hypothesis that the researcher wants to reject.

B. The null hypothesis is the hypothesis that the researcher wants to accept.

C. The alternative hypothesis is the hypothesis that the researcher wants to reject.

Q.1112 Which of the following assumptions is *least likely* required for the difference in means test based on two samples?

A. The two samples are independent.

B. The two populations have equal variances.

C. The two populations are normally distributed.

Q.1113 Which of the following statements is *most accurate*?

A. The alternative hypothesis is what is accepted if there is sufficient evidence to reject the null hypothesis.

B. The alternative hypothesis is what is accepted if there is sufficient evidence to accept the null hypothesis.

C. The null hypothesis is what is accepted if there is sufficient evidence to reject the alternative hypothesis.

Q.1114 When hypothesis testing, the choice between using a critical value based on the z-distribution or the t-distribution *most likely* depends on:

A. The sample size.

B. The distribution of the population.

C. The sample size and the distribution of the population.

Q.1115 Which of the following statements is *most accurate*?

A. The p-value is the probability of obtaining a test statistic that would lead to a rejection of the null hypothesis, assuming the null hypothesis is not true.

B. The p-value is the probability of obtaining a test statistic that would lead to a rejection of the null hypothesis, assuming the null hypothesis is true.

C. Neither A) nor B)

Q.1116 The *most appropriate* test statistic for a test of the equality of variances for two normally distributed random variables, based on two independent random samples, is the:

A. t-test.

B. F-test.

C. Chi-squared test.

Q.1117 Which of the following statements about the F-distribution and the chi-square distribution is *least accurate*?

A. Both distributions are asymmetrical.

B. Both distributions are bound by zero on the left.

C. Both distributions have means that are less than their standard deviations.

Q.1118 The *most appropriate* test statistic to test the hypothesis that the variance of a normally distributed population is equal to 13 is the:

A. t-test.

B. F-test.

C. Chi-squared test.

Q.1120 For two independent samples from two normally distributed populations, the difference in means can *most likely* be tested using the:

A. F-test.

B. t-statistic.

C. Chi-squared test.

Q.1121 Which of the following statements is *most likely* correct?

A. Parametric tests do not rely on assumptions regarding the distribution of the population but are specific to population parameters.

B. Parametric tests rely on assumptions regarding the distribution of the population but are not specific to population parameters.

C. Neither A) nor B)

Q.1887 Which of the following is the *most accurate* sequence of steps in hypothesis testing?

A. State the hypothesis, select the level of significance, compute the test statistic, formulate the decision rule, and make a decision.

B. State the hypothesis, select the significance level, formulate the decision rule, compute the test statistic, and make a decision.

C. State the hypothesis, formulate the decision rule, select the significance level, compute the test statistic, and make a decision.

Q.1888 Which of the following statements about hypothesis testing is the *least accurate*?

A. A Type II error is failing to reject a false null hypothesis.

B. The null hypothesis is a statement about the value of a population parameter.

C. If the alternative hypothesis is H_a: M > Mo, a two-tailed test is appropriate.

Q.1890 For the calculation of the test statistic, the *most appropriate* formula is:

A. $\frac{\text{Sample Mean - Hypothesized mean}}{\text{Standard error of sample mean.}}$

B. $\frac{\text{Population Mean - Sample Mean}}{\text{Standard error of sample mean.}}$

C. $\frac{\text{Population Mean - Sample Mean}}{\text{Standard Deviation.}}$

Q.1891 While performing a hypothesis test, Albert Khan is told that his analysis suffers from a Type I error. It therefore *most likely* indicates that:

A. Khan rejected the null hypothesis when it was actually false.

B. Khan rejected the null hypothesis when it was actually true.

C. Khan failed to reject the null hypothesis when it was actually false.

Q.1893 Is the following statement *most likely* correct?
'' The decision rule for rejecting or failing to reject the null hypothesis is based on the distribution of the test statistic. If the test statistic follows a normal distribution, the decision rule is based on critical values determined from the z-distribution.''

A. Yes.

B. No, because if the test statistic follows a normal distribution, the decision rule is based on critical values determined from the t-distribution.

C. No, because the decision rule for rejecting or failing to reject the null hypothesis is based on the value of the test statistic and the critical value.

Q.1894 A two-tailed hypothesis test at the 95% significance level with a p-value of 2.14% *most likely* indicates that:

A. at a 2% significance level, we can reject the null hypothesis.

B. at a 3% significance level, we can reject the null hypothesis.

C. at a 3% significance level, we cannot reject the null hypothesis.

Q.1895 Which of the following statement(s) is/are *most accurate*?
I. Decreasing the significance level will decrease the probability of failing to reject a false null
II. Decreasing the significance level will increase the power of the test.

A. Only II is correct.

B. I and II are correct.

C. I and II are incorrect.

Q.1896 A survey is conducted to determine if the average starting salary of investment bankers is equal to or greater than $57,000 per year. Given a sample of 115 newly employed investment bankers with a mean starting salary of $65,000 and a standard deviation of $4,500, and assuming a normal distribution, the test statistic is *closest to*:

A. 19.06

B. 204.40.

C. 419.62

Q.1897 Hilda believes that the average return on equity in the consumer durables industry is greater than 8%. The null (H_0) and the alternative (H_a) hypotheses for this study are *most likely*:

A. H_0: M = 0.08 versus H_a: M ≠ 0.08

B. H_0: M ≥ 0.08 versus H_a: M < 0.08

C. H_0: M ≤ 0.08 versus H_a: M > 0.08

Q.1899 The *most appropriate* hypothesis test concerning the variance of a normally distributed population is referred to as the:

A. Z-test.

B. F-test.

C. Chi-squared test.

Q.1900 Which of the following statement(s) is/are *most accurate*?
I. Nonparametric tests have more assumptions than parametric tests.
II. When data is based on ordinal measurements, we use nonparametric tests.

A. Both statements are correct.

B. Both statements are incorrect.

C. Only one statement is correct

Q.1901 A large positive value of the Spearman rank correlation such as 0.90 would *most likely* indicate that:

A. a high rank in one year is associated with a low rank in the second year.

B. a high rank in one year is associated with a high rank in the second year.

C. a high rank in one year will not have any impact on the rank in the second year.

Q.2763 A sample of 100 students is currently renting rooms in the mean distance of 18 miles from a small U.S. College. Assuming that the population is normally distributed and the standard deviation of the sample is 14 miles, the 99% confidence interval for the population mean is *closest to*:
(See Z-table)

A. [15.26 miles; 20.74 miles]

B. [16.6 miles; 19.4 miles]

C. [14.4 miles; 21.6 miles]

Q.2764 The mean return of a sample of 36 BB+ corporate bonds is 7.5%, and the sample's standard deviation is 14%. Assuming that the population is normally distributed and the population variance is unknown, based on t-distribution, the 95% confidence interval for the population mean is *closest to*?
(See t-table)

A. [2.77%; 12.23%]

B. [2.93%; 12.06%]

C. [3.56%; 11.43%]

Q.2765 Which of the following is the *most appropriate* test statistic for calculating confidence intervals for a normally distributed population mean whose variance is unknown and the sample size is less than 30?

A. z-statistic.

B. t-statistic.

C. F-statistic.

Q.2773 If a researcher wants to test that the mean return of 50 small-cap stocks from the Singapore Exchange is greater than 14%, the alternative hypothesis for the test is *most likely*:

A. H_a: $\mu \neq 14\%$.

B. H_a: $\mu > 14\%$.

C. H_a: $\mu < 14\%$.

Q.2775 An analyst believes that the mean return over 24 months on Geko Corp. shares is different from 0%. Determine which of the following is the *most likely* decision rule?

A. Reject H_0 if the test statistic > the upper critical value.

B. Reject H_0 if the test statistic < the lower critical value.

C. Reject H_0 if the test statistic > the upper critical value OR if the test statistic < the lower critical value.

Q.2776 A quantitative analyst has calculated the mean holding period return (HPR) of 1% for 110 European corporate bonds with a standard deviation of 2%. If the analyst wants to test at a 5% level of significance that the mean HPR on European corporate bonds is different from zero, then the test statistic is *closest to*:

A. 0.19

B. 1.96

C. 5.24

Q.2777 A quantitative analyst has calculated a mean HPR of 1% and a standard deviation of 2% for 110 European corporate bonds. If the analyst wants to test at a 5% level of significance that the mean HPR on European corporate bonds is different from zero, then which of the following is the *most accurate* result of the test?

A. Reject H_0: $\mu = 0\%$

B. Reject H_a: $\mu \neq 0\%$

C. Accept H_0: $\mu = 0\%$

Q.2778 Gerry Smithson conducted a hypothesis test at a 1% level of significance to check if the mean return of a population of stocks is greater than zero. The mean of the sample of 121 stocks is 1% with a standard deviation of 5%. Suppose Smithson accepted the alternative hypothesis, which of the following statements is *most accurate*? (See Normal Table)

A. Smithson committed a Type I error by accepting the alternative hypothesis.

B. Smithson committed a Type II error by accepting the alternative hypothesis.

C. Smithson correctly accepted the alternative hypothesis; no error was made.

Q.2779 Which of the following is the *most appropriate* explanation of a Type II error?

A. A Type II error refers to rejecting the null hypothesis when it is actually true.

B. A Type II error refers to the failure to reject the null hypothesis when it is false.

C. A Type II error refers to a failure to reject the null hypothesis when it is actually true.

Q.2780 If the level of significance is 5%, the type I error is 15%, and the Type II error is 20%, then the probability of correctly rejecting the null hypothesis when it, in fact, false is *closest to*:

A. 80%.

B. 85%.

C. 95%.

Q.2781 A one-tailed (H_0: $\mu \geq 0\%$) test statistic has a p-value of 0.0228. At a 1% significance level, which of the following statements is *most accurate*?

A. The null hypothesis is rejected as the p-value is greater than the significance level.

B. The null hypothesis is not rejected as the p-value is greater than the significance level.

C. The null hypothesis is not rejected as the p-value is not greater than the significance level.

Q.2783 An analyst is conducting a test to identify if the mean return of one sample of a population is greater than the other sample of the same population. If the H_0: μ1 - μ2 ≥ 0 is rejected, which of the following option is *most likely* true?

A. H_a: μ1 ≠ μ2

B. H_a: μ1 > μ2

C. H_a: μ1 < μ2

Q.2785 An analyst drew 27 paired observations to test if the mean return of two portfolios differs from each other at a 1% level of significance. Assume that the distribution of each portfolio is normal with an unknown population variance. Using the following table, construct the appropriate hypothesis.

	Portfolio 1	Portfolio 2	Differences
Mean Return	17	21.25	4.25
Standard Deviation	10.5	16.75	6.25

A. H_0: μ1 ≥ μ2 and H_a: μ < μ2

B. H_0: μ1 ≤ μ2 and H_a: μ1 > μ2

C. H_0: μd = 0 and H_a: μd ≠ 0

Q.2786 An analyst drew 27 paired observations to test if the mean return of two portfolios differs from each other at a 1% level of significance. Assume that the distribution of each portfolio is normal with an unknown population variance. Using the following table, the test statistic is *closest* to:

	Portfolio 1	Portfolio 2	Differences
Mean Return	17	21.25	4.25
Standard Deviation	10.5	16.75	6.25

A. 3.53

B. 7.51

C. 18.36

Q.2788 Which of the following probability distributions is *least likely* bounded by 0?

A. z-distribution.

B. F-distribution.

C. Chi-distribution.

Q.2789 Which of the following is the *most appropriate* test statistic of an F-test?

A. $\frac{\bar{X}-\mu_0}{\sigma/\sqrt{n}}$

B. $\frac{s_1^2}{s_2^2}$

C. $\frac{(n-1)s_1^2}{s_2^2}$

Q.2790 Which of the following tests is the *least appropriate* when testing the hypothesis of whether a variable is normally distributed?

A. Runs tests.

B. Parametric tests.

C. Non-parametric tests.

Q.2791 Which of the following tests is *most appropriately* used to assess the linear relationship between the ranks of two variables within their sample when the sample data is not normally distributed?

A. Parametric tests.

B. Correlation coefficients.

C. Spearman rank correlation tests.

Q.3446 Consider the following tests:

I. Testing a drug for its effect on humans.
II. Testing the manufacturing process of a screwdriver.

Which of the following statements is *most accurate*?

A. The p-value for test I will be equal to the p-value for test II.

B. The p-value for test I will be lower than the p-value for test II.

C. The p-value for test I will be higher than the p-value for test II.

Q.3453 Rick Gervais has gathered data on the daily returns generated by the Dow Jones Index. He believes that the mean daily return generated by the index is greater than 0.10%, so Gervais constructs a hypothesis test. If he wants to minimize the probability of a Type I error, then he is *most likely* to:

A. Increase α.

B. Minimize Type II error.

C. Increase the sample size.

Q.3471 If the population variance is known, then the *most appropriate* hypothesis test is the:

A. t-test.

B. z-test.

C. F-test.

Q.3474 A chi-square test is *most appropriate* for tests concerning:

A. a single variance.

B. differences between two population means with variances assumed to be equal.

C. differences between two population variances assumed to not be equal.

Q.3477 While conducting a study, a researcher computes the probability of Type I and Type II errors that stood at 5% and 2%, respectively. The power of the test is *closest* to:

A. 93%.

B. 95%.

C. 98%.

Q.3478 A portfolio manager observes that the weekly return generated by a portfolio of high-beta stocks stood at 5%. The standard deviation of the portfolio return stood at 1.50%. However, the manager observes that the standard deviation of the portfolio return for the recent 15 weeks stood at 2.00%. The portfolio manager wants to determine whether the standard deviation of the portfolio return has increased from 1.50% to 2.00%.
The test statistic to test for the above hypothesis is *closest* to:

A. 0.37

B. 1.78

C. 24.89.

Q.3479 A portfolio manager believes that returns on pharmaceutical stocks are more volatile than the returns generated on e-commerce stocks. To check this hypothesis, the portfolio manager collects the data summarized in exhibit 1.

Exhibit 1: Volatility in Pharmaceutical vs. e-Commerce Stocks

	Pharma Stock	e-Commerce Stocks
Standard Deviation	1.50%	2.10%
Sample Size	20	25

The value of the test statistic is *closest* to:

A. 1.51.

B. 1.70

C. 1.96

Q.3480 A quantitative analyst made the following statements:
I. Parametric tests are recommended for observations that follow a Bernoulli distribution.
II. Non-parametric tests are recommended for normally distributed observations.
III. The Spearman rank correlation test is recommended for normally distributed observations.

Which of these statements is/are *most accurate*:?

A. I only

B. I & III only

C. I, II & III

Q.3510 Consider the following hypotheses:

I. The quarterly returns generated by US Pharmaceutical companies is greater than 2.25%.
II. The average GMAT score of students studying Finance in the University of Alberta is more than 700.
III. The average height of Dublin College students is not equal to 180 centimeters.

Which of these hypotheses will *most likely* be tested using a two-tailed test?

A. III only

B. II & III only

C. I & II only

Q.3515 Given a z-test, the *most appropriate* decision rule is to:

A. Reject H_1.

B. Reject H_0 if the z-statistic falls within the critical region.

C. Accept H_0 if the z-statistic falls within the critical region.

Q.3516 A portfolio manager wants to compare the returns generated by actively and passively managed funds. He believes that both methods generate the same exact return. The data collected by the manager is given in the following exhibit.

Exhibit: Data Compiled - Passive vs. Active Management

	Passive Management	Active Management
Mean Return	1.25%	2.00%
Standard Deviation	0.50%	0.75%
Sample Size	30	32

Assuming that the samples are independent, the population means are normally distributed, and the population variances are equal, the degrees of freedom for the test are *closest* to:

A. 60.

B. 61.

C. 62.

Q.3738 50 CFA exam candidates were randomly sampled and were found to have an average IQ of 130. The standard deviation among candidates is known (approximately 20). Assuming that IQs follow a normal distribution, a 2-sided 95% confidence interval for the mean IQ of CFA candidates is *closest* to:

A. [125; 135]

B. [130; 135.5]

C. [124.5; 135.5]

Q.3739 After 72 CFA candidates took a mock exam, the mean score was 75. Assuming that the population standard deviation is 10, construct a 99% confidence interval for the mean score on the mock exam, and the result will be *closest* to:

A. [75; 85]

B. [65; 75]

C. [71.96; 78.04]

Q.3740 An investment firm intends to conduct a test to determine whether bonuses have any significant effect on job performance. The head of the human resource department develops the following sets of possible hypotheses.

I. H_0: Bonuses do not have any effect on job performance.
   H_1: Bonuses improve job performance
II. H_0: Bonuses do not have any effect on job performance
   H_1: Bonuses reduce job performance
III. H_0: Bonuses do not have any effect on job performance
   H_1: Bonuses affect job performance

Which of the above hypotheses *most accurately* imply a two-sided test?

A. I

B. II

C. III

Q.3741 A random sample of 50 CFA exam candidates was found to have an average IQ of 125. The standard deviation among candidates is known (approximately 20). Assuming that IQs follow a normal distribution, the statistical test (5% significance level) to determine whether the average IQ of CFA candidates is greater than 120 is *closest* to.
(Compute the test statistic and give a conclusion).
Note: 5% significant level = z score value of 1.6449.

A. Test statistic: 1.768; Reject H_0

B. Test statistic: 1.768; Fail to reject H_0

C. Test statistic: 1.0606; Fail to reject H_0

Q.3742 Decreasing the level of significance of a hypothesis test will *most likely*:

A. Increase the type I error

B. Decrease the likelihood of committing a type II error

C. Decrease the likelihood of rejecting the null hypothesis when it's in fact true

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Q.3743 Justin Heinz, CFA, suspects that the earnings of the insurance industry are more divergent than those of the banking industry. In a bid to confirm his suspicion, Heinz collects data from a total of 31 insurance companies and establishes that the standard deviation of earnings across that industry is $4.8. Similarly, he collects data from 41 banks and establishes that the standard deviation of earnings across that industry is $4.3. Conduct a hypothesis test at the 5% level of significance to determine if the earnings of the insurance industry have a greater standard deviation than those of the banking industry. Which of the following choices is *most likely* correct? **Choice I.** H0: $s_1^2 \leq s_2^2$ and H1: $s_1^2 > s_2^2$ Critical Value: 1.2461 Decision: Earnings are statistically not significant from one another **Choice II.** H0: $s_1^2 \leq s_2^2$ and H1: $s_1^2 > s_2^2$ Critical value: 1.74 Decision: Earnings are statistically not significant from one another **Choice III.** H0: $s_1^2 = s_2^2$ and H1: $s_1^2 \neq s_2^2$ Critical value: 1.2461 Decision: Earnings are statistically significant from one another

A. I

B. II

C. III

Q.3823 A nonparametric test is *most likely* preferred to a parametric test when:

A. Stronger measurement scales are required.

B. The randomness of a sample is being questioned.

C. The population from which the sample is drawn is assumed to be normally distributed.

Q.4026 Which of the following test is *most appropriate* when testing the difference between the variances of two normally distributed populations?

A. t-test.

B. F-test.

C. Chi-square test.

Learning Module 9: Parametric and Non Parametric Tests of Independence

Q.4447 Assume a financial analyst, Alex Perez, is examining the significance of the correlation between the monthly returns of ETF 2 and the overall market index based on the table provided with 48 monthly observations. The sample correlation, $r_{ETF2,Market}$, is 0.9096. Perez wishes to use a t-test to check if the correlation is significant at a 0.01 level of significance. The sample t-table is given below:

df	p = 0.10	p = 0.05	p = 0.025	p = 0.01	p = 0.005
31	1.309	1.696	2.040	2.453	2.744
42	1.302	1.682	2.018	2.418	2.698
43	1.302	1.681	2.017	2.416	2.695
44	1.301	1.680	2.015	2.414	2.692
45	1.301	1.679	2.014	2.412	2.690
46	1.300	1.679	2.013	2.410	2.687
47	1.300	1.678	2.012	2.408	2.685
48	1.299	1.677	2.011	2.407	2.682

The conclusion about the significance of the correlation between ETF 2 and the market index is:

A. Significant because the calculated t-statistic is greater than the critical value.

B. Not significant because the calculated t-statistic is less than the critical value.

C. Not significant because the calculated t-statistic is greater than the critical value.

Q.4451 The following contingency table shows the responses of two categories of investors (employed vs. self-employed) with regard to their risk tolerance levels (low, medium, or high). The total sample size is 200 investors.

	Low	Medium	High	Total
Employed	45	55	20	120
Self-Employed	30	40	10	80
Total	75	95	30	200

If we wish to test whether there is any significant difference between employed and self-employed investors concerning risk tolerance levels, the test statistic is *closest to:*

A. 0.222.

B. 0.333.

C. 0.730.

Q.4676 What type of test would you use to assess the correlation between excess risk-adjusted return (alpha) and mutual fund expense ratios for US large-cap growth funds?

A. Parametric test

B. Nonparametric test

C. Chi-square test

Q.4695 What are the null and alternative hypotheses for assessing the correlation between excess risk-adjusted return (alpha) and mutual fund expense ratios for US large-cap growth funds?

A. $H0 : \rho = 0$ versus $Ha : \rho \neq 0$

B. $H0 : \rho \leq 0$ versus $Ha : \rho > 0$

C. $H0 : \rho \geq 0$ versus $Ha : \rho < 0$

Q.4696 What is the *most* appropriate test statistic for conducting a test of correlation between excess risk-adjusted return (alpha) and mutual fund expense ratios for US large-cap growth funds using a nonparametric approach?

A. Spearman rank correlation coefficient

B. Pearson correlation coefficient

C. Chi-square test statistic

Q.4697 If the calculated test statistic for assessing the correlation between excess risk-adjusted return (alpha) and mutual fund expense ratios is -0.55177, and the critical values at a 0.05 level of significance are ±2.306, what decision is *most likely* to be made?

A. Reject the null hypothesis

B. Fail to reject the null hypothesis

C. Cannot be determined from the information given

Q.4698 What is the significance level used in the test of correlation between excess risk-adjusted return (alpha) and mutual fund expense ratios for US large-cap growth funds?

A. 0.05

B. 0.01

C. 0.10

Q.4699 What type of correlation coefficient is used when the assumptions for the parametric Pearson correlation is *least likely* to be met, such as when dealing with non-normally distributed variables?

A. Pearson correlation coefficient

B. Kendall's tau

C. Spearman rank correlation coefficient

Q.4700 What are the null and alternative hypotheses to test whether the dividend and financial leverage groups are independent of one another?

A. H0: Dividend and financial leverage ratings are not related, Ha: Dividend and financial leverage ratings are related.

B. H0: Dividend and financial leverage ratings are related, Ha: Dividend and financial leverage ratings are not related.

C. H0: Dividend and financial leverage ratings are independent, Ha: Dividend and financial leverage ratings are dependent.

Q.4703 What conclusion can be drawn if the p-value associated with the chi-square test statistic is 0.03 at a 5% level of significance?

A. Reject the null hypothesis.

B. Fail to reject the null hypothesis.

C. Accept the null hypothesis.

Q.4704 What are the null and alternative hypotheses to test whether the dividend and financial leverage groups are independent of one another?

A. Null hypothesis: Dividend and financial leverage ratings are related; Alternative hypothesis: Dividend and financial leverage ratings are not related

B. Null hypothesis: Dividend and financial leverage ratings are not related; Alternative hypothesis: Dividend and financial leverage ratings are related

C. Null hypothesis: Dividend and financial leverage ratings are independent; Alternative hypothesis: Dividend and financial leverage ratings are dependent

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Q.4707 What is the significance of the critical value in the chi-square test of independence at a 5% level of significance?

A. The critical value indicates the probability of committing a Type I error.

B. The critical value signifies the threshold beyond which we reject the null hypothesis.

C. The critical value determines the strength of the relationship between the variables.

Q.4708 Which statement accurately describes the degrees of freedom in a chi-square test of independence? The degrees of freedom is:

A. determined by the number of observations in the contingency table.

B. calculated as the difference between the total number of observations and the number of cells in the table.

C. equal to the product of one less than the number of rows and one less than the number of columns in the contingency table.

Q.4727 Which statement is *most likely* true regarding the significance level in testing the correlation coefficient between two variables' returns?

A. A lower significance level increases the likelihood of rejecting the null hypothesis.

B. A higher significance level increases the likelihood of Type I error.

C. The choice of significance level does not affect the rejection of the null hypothesis.

Q.4728 In testing the correlation coefficient between two variables' returns, what factor *most likely* determines the critical t-value used for hypothesis testing?

A. The level of significance chosen by the analyst.

B. The magnitude of the sample correlation coefficient.

C. The degree of freedom associated with the sample size.

Q.4730 Which statement is *most likely* true regarding the t-test statistic used in testing the correlation coefficient between two variables' returns?

A. A higher t-test statistic indicates stronger evidence against the null hypothesis.

B. A lower t-test statistic suggests a higher probability of Type II error.

C. The t-test statistic is independent of the sample size.

Learning Module 10: Simple Linear Regression

Q.225 A stock's returns for the past four years are as follows: 12%, 9.5%, 8%, 14.7%. The geometric mean return is *closest to*:

A. 11.02%

B. 11.05%

C. 51.90%

Q.407 Consider the following distribution, 3.5%; 3.8%; 5.9%; 9.6%; 12.4%; 2.3%. The second quintile is *closest to*:

A. 3.64%

B. 3.74%

C. 3.80%

Q.3426 Which of the following is the *most appropriate* description of a parameter?

A. A numerical measure that describes a characteristic of a sample.

B. A numerical measure that describes a characteristic of a population.

C. A statistical inference that describes a characteristic of a population.

Q.3910 Tracy, senior analyst at CMSSP Capital reviewed Cronin (his junior's) regression analysis. He asked Cronin how the key inputs to the regression could affect the ultimate results. Cronin explained the effects of some of these inputs and assumptions, Cronin made the following comments: **Comment 1**: "The standard error of estimate is an important input for a hypothesis test. Small standard errors result in both tighter confidence intervals and tighter prediction intervals." **Comment 2**: "The estimated value for the variance of the independent variable can also affect hypothesis testing. The higher the assumed variance, the tighter the prediction intervals. However, changes in the assumed variance will have no effect on the confidence interval." Cronin is *most* accurate with respect to:

A. Comment 1 only.

B. Comment 2 only.

C. Both comments 1 and 2.

Q.3911 "For our regression model to be valid, a linear relationship must exist between EPS growth and changes in return spread." This statement implies that:

A. EPS growth and changes in return spread must be discrete random variables.

B. The correlation coefficient between EPS growth and Changes in return spread must be greater than zero but less than one.

C. The slope coefficient and the intercept are raised to the first power only, and neither of them is divided or multiplied by another regression parameter.

Q.3912 Kim Richard has been looking at ways to increase efficiency in the construction process especially with regard to fuel consumption. She ran a regression explaining the variation in fuel consumption as a function of distance. The total variation of the dependent variable was 160.85, the explained variation was 80.15, and the unexplained variation was 100.70. She had 60 monthly observations. The standard error of the estimate in the regression is *closest to*:

A. 1.32.

B. 1.52.

C. 1.74.

Q.3915 An analyst is developing a regression model to forecast project cost based on the construction costs. He has gathered the following information.

- Multiple R: 0.8821
- R-squared: 0.7651
- Standard Error of Estimate: 0.6346
- Observations: 62
- Variance of mean construction costs = 27.9
- Variance of mean forecasted project price = 18.35
- Mean construction costs = 98.54
- Correlation between mean construction costs and mean forecasted price = 0.75

The standard deviation of the prediction error given independent variable equals 425 is *closest to*:

A. 5.06.

B. 25.64.

C. 41.09.

Q.3916 Which of the following statement is *most likely* correct?

A. If the sample size is increased, the standard error of the estimated measure will increase. This will reduce the reliability of regression results.

B. If the sample size is increased, the standard error of the estimated measure will decrease. This will increase the reliability of regression results.

C. If the sample size is increased, the standard error of the estimated measure will remain constant. This will not affect the reliability of regression results.

Q.3917 Which of the following statements is *most likely* correct?

A. The standard error of estimate is the standard deviation of the actual values of the independent variable.

B. The standard error of estimate measures the standard deviation of the residual term; its numerator is calculated as the difference between the actual and predicted value of the dependent variable.

C. The standard error of estimate measures the standard deviation of the residual term; its numerator is calculated as the difference between the actual and predicted value of the independent variable.

Q.3918 An analyst is forecasting quarterly sales of Smart Inc., a smart TV manufacturer based in Thailand. The regression model is:

$$\text{Sales}_t = b_0 + b_1 \text{Sales}_{t-1} + \epsilon_t$$

The regression results for the smart TV sales model are presented below:

R-squared: 0.7436
Observations: 120

	Coefficient	Standard Error
Intercept	313.24	99.43
Lag 1	0.67	0.16

If TV sales in the first quarter were 1,137, the number of sales forecasted for the second quarter is *closest to*:

A. 762.

B. 1,075.

C. 1,137.

Q.3920 An analyst is assessing the contagion effect or spread of market disturbances in financial markets. He picks up four globally recognized indices and prepares a correlation matrix using monthly returns of various stock indices for the last 4 years as shown below:

	DJIA	S&P 500	FTSE 100	CAC 40
DJIA	1.00			
S&P 500	0.78	1.00		
FT SE 100	0.43	0.66	1.00	
CAC 40	0.38	0.33	0.80	1.00

The correlation coefficient is not statistically significant at the 0.01 significance level for which pair of market indices? (See the t-table)

A. CAC 40 with DJIA.

B. FT SE 100 with DJIA.

C. CAC 40 with S&P500.

Q.3921 Richard Zeng is developing a regression model to predict stock market returns using the GDP growth rate. He considers quarterly returns of the S&P 500 (S&P) as a proxy for stock market returns and quarterly changes in GDP as GDP growth rate (GDP Growth). The linear regression model is as follows:

$$\text{S\&P} = \beta_0 + \beta_1(\text{GDP Growth}) + \epsilon$$

Zeng develops the following partial ANOVA table and regression statistics based on the last 10 years of quarterly data pertaining to the S&P 500 and GDP.

	DF	SS
Regression	1	108
Residual	38	To be calculated
Total	39	155.5

The percentage of variation in the S&P 500 return that can be attributed to the GDP growth rate is *closest to:*

A. 31%.

B. 69%.

C. 100%.

Q.3922 Richard Zeng is developing a regression model to predict stock market returns using the GDP growth rate. He considers quarterly returns of the S&P 500 (S&P) as a proxy for stock market returns and quarterly changes in GDP as GDP growth rate (GDP Growth). The linear regression model is as follows:

$$\text{S\&P} = \beta_0 + \beta_1(\text{GDP Growth}) + \epsilon$$

The significance of Zeng's model for predicting the S&P 500 return using the GDP growth rate can be tested by:

A. t-test only.

B. F-test only.

C. either t-test on slope coefficient or F-test model because both will lead to the same conclusion.

Q.3923 Zeng is developing a regression model to predict stock market returns using the GDP growth rate. He considers quarterly returns of the S&P 500 (S&P) as a proxy for stock market returns and quarterly changes in GDP as GDP growth rate (GDP Growth). The linear regression model is as follows:

$$\text{S\&P} = \beta_0 + \beta_1(\text{GDP Growth}) + \epsilon$$

Zeng develops the following partial ANOVA table and regression statistics based on the last 10 years of quarterly data pertaining to the S&P 500 and GDP.

	DF	Sum of Squares
Regression	1	108
Residual	38	To be calculated
Total	39	155.5

The standard error of the estimate for Zeng's model to predict stock market returns using the GDP growth rate is *closest to*:

A. 0.0366.

B. 0.0534.

C. 1.1180.

Q.3924 The statistic which is used to measure how well a given linear regression model captures the relationship between the dependent and independent variables is *most likely* known as:

A. Standard error of the estimate.

B. Intercept of the regression model.

C. Slope of the independent Variable.

Q.3925 Which of the following statistic is *most likely* used to identify the fraction of the total variation that is explained by the regression?

A. Coefficient of determination.

B. Intercept of the regression model.

C. Slope of the independent variable.

Q.3926 Mike Far explains the linear regression model and its underlying assumptions using the following statement: “The estimated parameters in a linear regression model maximize the sum of the squared regression residuals.” The above statement on estimated parameters in a linear regression model is *most likely*:

A. Correct.

B. Incorrect, because the model minimizes the sum of squared regression residuals.

C. Incorrect, because the model minimizes the sum of the regression residuals.

Q.3927 An analyst has prepared a regression analysis comparing the price of gold to the average cost of purchases of finished gold jewelry of a retailer of fine jewelry and watches. The regression results are shown in Exhibit 1 below.

Exhibit 1: 1983-2013 Annual Data
(31 Observations)

Variable	Coefficient	SE of Coefficient
Intercept	11.06	7.29
Cost of gold	2.897	0.615

*SEE=117.8

The per ounce price of gold that corresponds to the $1,500 cost of finished jewelry is *closest to*:

A. $513.96.

B. $517.77.

C. $521.59.

Q.3928 Singh, an analyst at Delta Advisory Firm, has prepared a regression analysis comparing the price of gold to the average cost of purchases of finished gold jewelry of a retailer of fine jewelry and watches. The regression results are shown in Exhibit 1 below.

Exhibit 1: 1983-2013 Annual Data
(31 Observations)

Variable	Coefficient	SE of Coefficient
Intercept	11.06	7.29
Cost of gold	2.897	0.615

*SEE=117.8

Singh commented “We may have a problem with parameter instability if the relationship between gold prices and jewelry costs has changed over the past 30 years.” Baker computes the test statistic and concluded that “We fail to reject the null hypothesis that the slope coefficient is equal to 4.0 at the 5% significance level.” Are Singh (Statement 1) and Baker (Statement 2) correct or incorrect regarding the usefulness of regression results described in Exhibit 1 and the value of the slope coefficient? Use the excerpt of the t-table below.

df	p = 0.10	p = 0.05	p = 0.025	p = 0.01	p = 0.005
⋮					
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
⋮					

A. Both Singh and Baker: Correct.

B. Both Singh and Baker: Incorrect.

C. Singh: Incorrect; Baker: Correct.

Q.3929 Xander Feng, CFA, is a quantitative analyst with Red Star Securities Ltd. Feng is forecasting quarterly sales of Xiomi Inc., a smart phone manufacturer based in China. The regression model is:

$$\text{Sales}_t = b_0 + b_1 \text{Sales}_{t-1} + \epsilon_t$$

The regression results for the smartphone sales model are presented in the exhibits below:

Exhibit 1: Regression statistics for smartphones sales model

	Coefficient	Standard Error
Intercept	313.24	99.43
Lag 1	0.67	0.16

R-squared: 0.7436
Observations: 120

If smartphone sales in first quarter were 1,137, the number of smartphone sales forecasted for the second quarter is *closest to*:

A. 762.

B. 1,075.

C. 1,137.

Q.3931 In which of the following functional forms the dependent variable is linear but the independent variable is logarithmic?

A. The Lin-log model and will be represented as $Y_i = b_0 + b_1 \ln X_i$.

B. The Log-lin model will be represented as $\ln Y_i = b_0 + b_1 X_i$

C. The Log-log model and will be represented as $\ln Y_i = b_0 + b_1 \ln X_i$.

Q.3932 In the log-lin model, which of the following statement (s) is *most likely* correct about the slope coefficient?

A. The slope coefficient in the log-lin model provides the absolute change in the dependent variable for a relative change in the independent variable.

B. The slope coefficient in the log-lin model is the relative change in the dependent variable for an absolute change in the independent variable.

C. The slope coefficient in the log-lin model is the relative change in the dependent variable for a relative change in the independent variable.

Q.3933 An analyst is comparing two regression models to analyze the relationship between auto sales and bank financing rates of a Country. The model which would better represent the relationship would *least likely* have:

A. higher F-statistic.

B. lower coefficient of determination (R^2).

C. lower standard error of estimate (S_e).

Learning Module 11: Introduction to Big Data Techniques

Q.3692 Alternative data refers to:

A. Data used for investment analysis arising from external sources, including financial statements and management presentations of comparable entities

B. Data used by investors to evaluate a company or product that is not related to financial statements

C. Data used by investors for investment analysis that is not within their traditional sources

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Q.3700 The big data revolution witnessed in the last 50 years is down to:

A. Exponential increase in the amount of data available

B. Increase in computing power and data storage capacity, at affordable cost

C. All of the above

Q.3707 Sensor data is *most likely* taken from:

A. individuals through their online activity such as product reviews, credit card purchases, and social media posts.

B. businesses and corporations, including sales information, credit card data, and corporate exhaust.

C. devices such as smartphones, cameras, and satellites.

Q.3709 Machine learning is:

A. The autonomous acquisition of knowledge through the use of computer programs

B. The ability of machines to execute coded instructions

C. The selective acquisition of knowledge through the use of computer programs

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Q.3710 Which of the following is most likely behind the increased adoption of automatic algorithmic trading?

A. Increased efficiency

B. Increased market destinations

C. Ability to execute large trades

Q.3712 A correct description of artificial intelligence is that:

A. It encompasses more advanced systems that are able to analyze information and make decisions based on machine-learning logic.

B. Its goals are very different from those of machine learning.

C. It terminates the need for human input in investment analysis.
