Quantitative
Discrete la so nguyen.
Continuous la so lem co the tin toan duoc

Qualitative
Nominal la du lieu liet ke, khong co thu tu
Ordinal Data la du lieu phan theo Rank, level, co thu tu

200 MULTIPLE-CHOICE QUESTIONS – SBST1303 ELEMENTARY STATISTICS

Each question has **one** correct answer. Choose A/B/C/D and check your work with the answer key at the end.

Topic 1 – Data Types & Classification (20 Qs)

1. The value "Blood group" (A, B, AB, O) is which type of variable? A. Discrete quantitative B. Continuous quantitative C. Nominal qualitative D. Ordinal qualitative
2. In a wage survey, the unit "million VND / month" represents a variable that is: A. Qualitative B. Continuous quantitative C. Discrete quantitative D. Nominal
3. A 1–5 Likert scale (very satisfied … very dissatisfied) is an example of a/an: A. Nominal variable B. Ordinal variable C. Discrete variable D. Continuous variable
4. The number of absent students each class session is a: A. Continuous variable B. Discrete variable C. Nominal variable D. Ordinal variable
5. In the category "education level" (High-school / Bachelor / Master / PhD), the data type is: A. Nominal B. Ordinal C. Discrete D. Continuous
6. Which of the following is **not** quantitative? A. Temperature B. Weight C. Hometown D. Height
7. Grouping "≤ 18, 19–35, > 35 years" generates what type of variable? A. Nominal B. Ordinal C. Discrete D. Continuous
8. Fill in the blanks: __ data are usually obtained by **counting**; __ data by **measuring**. A. Continuous – Discrete B. Nominal – Ordinal C. Discrete – Continuous D. Ordinal – Nominal
9. The question "Do you smoke?" (Yes / No) is a: A. Binary nominal variable B. Binary ordinal variable C. Discrete variable D. Continuous variable
10. The score "8.25" is treated as a: A. Discrete value B. Continuous value C. Rank D. Nominal label
11. In demography, **gender** is often coded 0/1. This is an example of: A. Automatic continuity B. Miscoding C. Binary coding for a nominal variable D. Ordinal variable
12. "Number of syntax errors in an exam" is: A. Continuous B. Discrete C. Nominal D. Ordinal
13. Choose the correct statement: A. Every discrete variable is ordinal B. Ordinal variables always have equal intervals C. Continuous variables take infinitely many values D. Nominal variables are ordered
14. "Eye colour" is considered: A. Nominal B. Continuous C. Ordinal D. Discrete
15. Converting salary into three **bands** "low–medium–high" yields a variable that is: A. Continuous B. Discrete C. Nominal D. Ordinal
16. **Ordinal** data differ from **nominal** data because they: A. Possess an order B. Have fixed intervals C. Contain infinite values D. Cannot be classified
17. Identify the **false** statement: A. Continuous variables can be grouped into classes B. Nominal variables have no order C. Discrete variables are exact measurements D. Ordinal variables indicate level or degree
18. A telephone number is treated as a: A. Discrete value B. Nominal label C. Continuous value D. Rank
19. "Time (seconds) to finish a run" is a: A. Discrete variable B. Nominal variable C. Continuous variable D. Ordinal variable

Poisson la su kien dien ra trong mot khong gian nhat dinh, doc lap

20. The variable “number of website visits” is best modelled by which theoretical distribution? A. Normal B. Poisson C. Hypergeometric D. Continuous uniform

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Topic 2 – Frequency Tables & Tabulation (20 Qs)

1. Which column in a frequency table stores cumulative counts? A. f B. rf C. cf D. Class
2. Sturges’ rule **K = 1 + 3.3 log₁₀(n)** is used to: A. Estimate number of classes B. Compute SD C. Test a hypothesis D. Find the median
3. When data have two decimal places, the **class boundaries** should differ by: A. 1 B. 0.1 C. 0.01 D. 0.001
4. The class midpoint equals: A. (lower + upper)/2 B. (upper freq + lower freq)/2 C. (rf + cf)/2 D. (Σx)/n
5. In every table the value __ always equals the total frequency: A. Σrf B. Σcf C. Σf D. Σ(midpoint)
6. Multiplying **rf × 100** gives the: A. Frequency B. Class percentage C. Cross-ratio D. Confidence level
7. To avoid overlapping classes we use: A. Stated limits B. Real limits C. Open ends D. Any of these
8. With n = 50, Sturges suggests K ≈ 6.6. The most suitable number of classes is: A. 4 B. 6 C. 7 D. 10
9. A **tally** mark technique is used for: A. Sampling B. Counting frequency C. Parameter estimation D. Hypothesis testing
10. If the **class width** is too small, the histogram will be: A. Over-clustered B. Too smooth to read C. Missing extremes D. Unaffected
11. Relative frequency distributions are useful when you need to: A. Compare two samples of different sizes B. Determine the class number C. Count quickly D. Perform a test
12. The formula **upper real limit = stated upper + 0.5** applies to: A. Continuous data B. Discrete integer data C. Ordinal data D. Nominal data
13. The class with the highest frequency is called the: A. Deterministic class B. Apex class C. Modal class D. Base class
14. An **ogive** depicts: A. Frequency B. Relative frequency C. Cumulative frequency D. Error rate 3.6
15. When the final cf totals 100, cf represents: A. Raw counts B. Cumulative percentage C. Deviation D. Margin of error
16. If class width = 10, consecutive lower limits differ by: A. 5 B. 10 C. 1 D. Arbitrary
17. When creating a table, outliers should be: A. Discarded B. Placed into the appropriate class C. Given their own class D. Both B & C
18. An **open class** is one that: A. Has no lower limit B. Has no upper limit C. A or B D. Has both limits
19. Cumulative relative frequency increases and ends at: A. 0 B. 0.5 C. 1 D. Depends on sample
20. For n = 200, a class frequency of 50 gives rf =: A. 0.25 B. 0.50 C. 25 D. 75

Relative = Frequency / Total

Topic 3 – Graphical Presentation (20 Qs)

1. A bar chart is appropriate for variables that are: A. Qualitative B. Continuous C. Discrete D. Both A & C
2. A **histogram** differs from a bar chart because its bars are: A. Spaced apart B. Touching C. Colour-coded D. Based on %
3. The frequency polygon is a line graph also called a(n): A. Ogive B. Polygon C. Stem-leaf plot D. Boxplot
4. In a pie chart, a central angle of 36° corresponds to a share of: A. 5 % B. 10 % C. 20 % D. 25 %

5. A multiple-bar chart is best for: A. Comparing one variable across two groups B. Displaying cumulative frequency C. Regression analysis D. Comparing deviation
6. The vertical axis of a histogram shows: A. Class B. Midpoint C. Frequency D. Class limit
7. In a "≤" ogive, the point (x, cf) means: A. Observations ≥ x B. Observations ≤ x C. Frequency of the class containing x D. Midpoint of x's class
8. A box-and-whisker plot **does not** show: A. Quartiles B. Median C. Outliers D. Variance
9. Adding a zero-frequency class before the first class when plotting an ogive helps to: A. Adjust scale B. Close the graph at origin C. Reduce bias D. Not necessary
10. Which plot checks **normality** most directly? A. Histogram B. Ogive C. Normal Q-Q plot D. Pie chart
11. A stem-and-leaf plot is useful when: A. n > 1000 B. n is small to moderate C. Data are nominal D. Comparing groups
12. With unequal class widths, the histogram should adjust the: A. Bar area B. Bar height C. Bar width D. All are wrong
13. Each percent on an ogive represents: A. Class frequency B. Cumulative proportion C. Number of classes D. Variance
14. A **Pareto** chart arranges bars in: A. Alphabetical order B. Time order C. Descending frequency D. Ascending value
15. Best chart for **two quantitative variables** is the: A. Scatter plot B. Bar chart C. Pie chart D. Ogive
16. In a boxplot, the **line inside the box** marks the: A. Mean B. Median C. Mode D. Q3
17. How should a "non-response" category be displayed on a pie chart? A. Combined with a small group B. Omitted C. A separate slice D. Not important
18. A heatmap is typically used for: A. Nominal variables B. Correlation matrices C. Time series D. Regression models
19. 3-D effects in bar charts generally: A. Increase accuracy B. Decrease readability C. Have no effect D. Are mandatory
20. A "bell-shaped" histogram suggests: A. Normal distribution B. Poisson C. Hypergeometric D. Exponential

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Topic 4 – Measures of Central Tendency (20 Qs)

1. If mean < median < mode, the distribution is: A. Symmetric B. Right-skewed C. Left-skewed D. Normalised
2. The mean of 5, 7, 7, 11 is: A. 7 B. 7.5 C. 8 D. 10
3. The median of 2, 4, 6, 8, 10, 12 is: A. 6 B. 7 C. 8 D. 9
4. Mode is most useful when you need: A. The most typical value B. An exact centre C. A symmetrical distribution D. Variance
5. For odd n, the median is the: A. (n+1)/2-th observation B. Mean of two middle values C. Mode D. Q3
6. The sum of $|x - \text{mean}|$ equals 0? A. Always B. Always > 0 C. = 0 only when n = 2 D. Undefined
7. Q1 corresponds to which percentile? A. P20 B. P25 C. P50 D. P75
8. In salary data, the mean is pulled upward by a: A. Left tail B. Right tail C. No change D. Slight decrease
9. Given mean = 60, median = 65, the distribution looks: A. Symmetric B. Slightly left-skewed C. Slightly right-skewed D. No conclusion
10. The inter-quartile range (IQR) = Q3 − Q1 measures: A. Central spread B. Deviation C. Variance D. Location
11. For a normal distribution, mean ± 1 σ covers about ___ % of data. A. 50 B. 68 C. 75 D. 95

12. The mode does not exist when: A. All data are unique B. Data are odd C. Many outliers D. No repeating value
13. The pooled-mean formula is: A. $\Sigma x/n$ B. $(n_1\bar{x}_1 + n_2\bar{x}_2)/(n_1 + n_2)$ C. (xmax + xmin)/2 D. $\Sigma f/\Sigma x$
14. The inter-quartile range contains ___ % of observations. A. 25 B. 50 C. 75 D. 100
15. The median is less affected by: A. Outliers B. Sample size C. Missing data D. Sorting
16. A distribution with two modes is termed: A. Unimodal B. Bimodal C. Multimodal D. Trimodal
17. Pearson's rule I: **Mode ≈ 3 Median − 2 Mean** works when the distribution is: A. 100 % precise B. Moderately skewed C. Normal D. Never
18. For 1, 2, 2, 3, 9 (mean = 3.2, median = 2) the mode = A. 2 B. 3 C. 9 D. None
19. When mean = median, the skewness ≈ A. 0 B. > 0 C. < 0 D. 1
20. Q2 is equivalent to the: A. Median B. Mean C. Mode D. P20

Topic 5 – Dispersion & Variability (20 Qs)

1. Sample variance s^2 is computed by: A. $\Sigma(x-\bar{x})^2 / n$ B. $\Sigma(x-\bar{x})^2 / (n-1)$ C. $\Sigma|x-\bar{x}| / n$ D. $\Sigma x^2 / n$
2. The standard deviation is: A. $\sqrt{s^2}$ B. $(s^2)^2$ C. s^2/n D. $\Sigma x/n$
3. When all values are equal, s^2 =: A. 1 B. n−1 C. 0 D. Undefined
4. IQR is more robust than the range because: A. It ignores outliers B. Uses all data C. Easier to compute D. Distribution-dependent
5. If Range = 40 and s = 8, the coefficient of variation CV = A. 0.20 B. 0.80 C. 5 D. 32
6. **Chebyshev** guarantees at least ___ % of observations within ± k s (k > 1) A. $1 - 1/k^2$ B. $1/k^2$ C. $k^2 - 1$ D. 68
7. Sum of squares SS = 200, n = 21. Then s^2 = ? A. 10 B. 9.52 C. 8 D. 5
8. For a normal distribution, $z = (x - \mu)/\sigma$ expresses: A. Standardised location B. Deviation C. Frequency D. Variance
9. The coefficient of variation (CV) allows you to: A. Compare dispersion across different units B. Compute mean C. Compare means D. Perform a test
10. s^2 decreases when: A. Adding values close to the mean B. Adding distant values C. Increasing n D. Adding outliers
11. With s = 0.3 and mean = 2, CV % ≈ A. 15 B. 0.15 C. 6.67 D. 60
12. Range reflects the: A. Width of distribution B. Peakedness C. Skewness D. Frequency
13. If s^2 = 25, then s = ? A. 125 B. 5 C. $\sqrt{25}/2$ D. 10
14. The pooled variance formula for two samples **does not** require: A. n_1, n_2 B. s_1^2, s_2^2 C. $\bar{x}_1$, $\bar{x}_2$ D. Q1, Q3
15. "Price volatility" is best measured by the: A. CV B. Mode C. Range D. IQR
16. If mean = 0, s^2 simplifies to $\Sigma x^2/(n-1)$. This happens when: A. Data are already standardised B. Small n C. Outliers present D. Never
17. For large n, the sample variance s^2 approximates the population: A. Sample variance B. σ^2 C. Mean D. CV
18. The range increases when: A. A value exceeds the current xmax B. A value near the mean is added C. Removing outliers D. Increasing the median
19. The **kurtosis** coefficient measures: A. Peakedness B. Central tendency C. Skewness D. Variance
20. Chebyshev with k = 3 ensures at least ___ % of data within ± 3 s. A. 75 B. 88.9 C. 95 D. 99

Topic 6 – Probability Fundamentals (20 Qs)

1. The sample space of tossing 2 coins contains: A. 2 outcomes B. 3 C. 4 D. 6
2. The **maximum** probability of a certain event equals: A. 0 B. 0.5 C. 1 D. Undefined
3. Events A and B are independent if: A. $P(A \cap B) = 0$ B. $P(A \cap B) = P(A)P(B)$ C. $P(A|B) = 0$ D. $P(A) + P(B) = 1$
4. Conditional probability $P(A|B) = ?$ A. $P(A \cap B) / P(B)$ B. $P(A)P(B)$ C. $P(B) / P(A)$ D. $P(A) - P(B)$
5. An **impossible** event has probability: A. –0.1 B. 0 C. 0.3 D. 1
6. In a 52-card deck, the probability of drawing a **spade** = A. 1/2 B. 1/4 C. 1/13 D. 4/13
7. Two events are **mutually exclusive** when: A. Their intersection is empty B. They are linked C. They are independent D. Complementary
8. The law of total probability is applied when: A. There is a contingency table B. The events partition the space C. No condition given D. All of these
9. If $P(A) = 0.2$, $P(B) = 0.6$ and A, B are independent $\Rightarrow P(A|B) =$ A. 0 B. 0.12 C. 0.2 D. 0.8
10. The complement of A is denoted: A. A′ B. $\bar{A}$ C. Ac D. All of these
11. A **tree diagram** is most useful for: A. Qualitative variables B. Discrete variables C. Sequential conditions D. Standardisation
12. The probability of **at least one** head in 3 coin tosses = A. 1/8 B. 3/8 C. 7/8 D. 1
13. The permutation nP r formula is used for: A. Seating arrangements B. Selecting a committee C. Combinations D. Undefined
14. Probability of drawing 2 **red** cards from 52 without replacement: A. 26C2 / 52C2 B. 26P2 / 52P2 C. 2/4 D. 1/13
15. If $A \subset B \Rightarrow P(A|B) = ?$ A. 0 B. 0.5 C. P(A)/P(B) D. 1
16. Probability of getting **at least two 6's** in 3 dice rolls = A. 1/36 B. 91/216 C. 25/216 D. 1/6
17. Addition rule: $P(A \cup B) = ?$ A. $P(A) + P(B)$ B. $P(A) + P(B) - P(A \cap B)$ C. $P(A)P(B)$ D. $P(A|B)$
18. Probability of drawing a **queen** or a **spade** = A. 4/52 B. 16/52 C. 19/52 D. 1/13
19. An intersection that is empty is also called a/an: A. Impossible event B. Certain event C. Symmetric event D. Complement
20. If $P(A) = 0.3$, $P(B) = 0.4$, $P(A \cap B) = 0.1 \Rightarrow P(A \cup B) =$ A. 0.7 B. 0.6 C. 0.5 D. 0.9

Topic 7 – Discrete R.V. & Binomial Model (20 Qs)

1. For a discrete r.v. X, the pmf must satisfy _____. A. $P(x) < 0$ B. $\Sigma P(x) = 0$ C. $\Sigma P(x) = 1$ D. Continuity
2. The expectation E(X) is computed as: A. $\Sigma x\ p(x)$ B. $\Sigma x^2\ p(x)$ C. $\Sigma x / p(x)$ D. $\Sigma p(x) / x$
3. $Var(X) = \Sigma(x-\mu)^2\ p(x)$ is equivalent to: A. $E(X^2) - \mu^2$ B. $\mu^2 - E(X^2)$ C. E(X) D. $\Sigma x\ p(x)$
4. A binomial experiment requires the number of trials to be: A. Arbitrary B. Variable C. Fixed n D. Infinite
5. If $X \sim Bin(n,p)$ then $P(X = k) = ?$ A. nCk p^k (1−p)^{n−k} B. nPk C. p^n D. Undefined
6. For a binomial variable, E(X) = A. np(1−p) B. $\sqrt{}$npq C. np D. n/p
7. Binomial variance Var(X) = A. np B. npq C. np^2 D. $\sqrt{}$npq
8. With n = 10, p = 0.3, P(X = 0) = A. 0.3^{10} B. 0.7^{10} C. 1 − 0.3^{10} D. 0
9. The binomial can be approximated by Poisson when n is large and p is: A. Large B. Small C. = 0.5 D. Any
10. When p = 0.5, the binomial distribution becomes: A. Left-skewed B. Normalised C. Symmetric D. Undefined
11. The probability of **failure** is denoted: A. p B. q C. 1 D. n

12. Combinations nCk = n! / ___! A. k!(n−k) B. n! C. (n−k)! D. k!
13. For a Poisson variable, the expectation λ equals: A. np B. λ C. σ^2 D. $\sqrt{\lambda}$
14. If Var(X) = E(X) then X follows a: A. Binomial B. Normal C. Poisson D. Hypergeometric
15. In a binomial, with small p and large n, the distribution is skewed to the: A. Left B. Right C. Symmetric D. Unknown
16. Using $P(X \geq 1) = 1 - P(X = 0)$ is typical in: A. Binomial B. Any C. Normal D. Hypergeometric
17. The moment-generating function (MGF) helps compute: A. Frequency B. Expectation C. SD D. Variance and higher moments
18. If P(X = 2) = P(X = 3) in Bin(5,p) ⇒ p ≈ ? A. 0.4 B. 0.5 C. 0.6 D. 0.8
19. For Poisson λ = 4, P(X = 0) = A. 0 B. e^{−4} C. 4 e^{−4} D. 1 − e^{−4}
20. The **hypergeometric** distribution applies to sampling: A. With replacement B. Without replacement C. Infinite time D. Ordered

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Topic 8 – Normal Model & Mean Inference (20 Qs)

1. The standard normal N(0,1) has its highest density at: A. z = −1 B. z = 0 C. z = 1 D. z = 2
2. A z-score = 2 means the observation is ___ σ from the mean. A. −2 B. 0 C. +2 D. +0.5
3. With μ = 50, σ = 5 ⇒ P(X > 55) = P(Z > 1) ≈ A. 0.341 B. 0.159 C. 0.5 D. 0.841
4. The 68–95–99.7 rule says $P(|Z| \leq 2) \approx$ A. 68 % B. 95 % C. 99.7 % D. 34 %
5. For $n \geq 30$, the central limit theorem states $\bar{X}$ is approximately ___. A. Normal B. Anything C. t-Student D. Exponential
6. The standard error of $\bar{X}$ is $\sigma/\sqrt{n}$. If n quadruples, SE will: A. Double B. Halve C. Quarter D. Remain
7. A 95 % CI for μ (σ known) is $\bar{X} \pm z_{0.975}\sigma/\sqrt{n}$. The z-value is: A. 1.64 B. 1.96 C. 2.58 D. 3
8. To narrow a CI, one should: A. Decrease n B. Increase confidence level C. Reduce σ D. Increase σ
9. For test H_0: μ = μ_0, reject H_0 when |z|: A. < $z_{\alpha/2}$ B. > $z_{\alpha/2}$ C. < 1 D. = 0
10. The p-value is: A. Probability H_0 is true B. Prob. of a statistic at least as extreme as observed C. α D. 1 − α
11. When σ is unknown and n is small, use the _____ distribution. A. t B. z C. χ^2 D. F
12. Degrees of freedom for t with n observations: A. n B. n − 1 C. n − 2 D. Depends
13. A t-based CI uses ν = ? A. n B. n − 1 C. n − 2 D. n + 1
14. Increasing confidence from 95 %→99 % makes the interval: A. Wider B. Narrower C. Unchanged D. Either
15. If p-value = 0.03 < α = 0.05 ⇒ A. Reject H_0 B. Fail to reject H_0 C. Error D. Reduce n
16. A **Type I error** occurs when: A. Reject H_0 while H_0 is true B. Fail to reject H_0 while H_0 is false C. Correct decision D. Increase n
17. Test power = 1 − ___. A. α B. β C. p D. t
18. When σ^2 is known, a χ^2 CI estimates _____. A. μ B. σ^2 C. p D. Sample var
19. Sampling error decreases when: A. Increase n B. Decrease n C. Decrease σ D. A & C
20. A two-tailed rejection region has combined area = A. α B. α/2 C. 1 − α D. β

Topic 9 – Proportion Estimation & Testing (20 Qs)

1. A CI for p: $\hat{p} \pm z_{\alpha/2}\sqrt{[\hat{p}(1-\hat{p})/n]}$ requires _____. A. $n\hat{p} \geq 5$ & $n(1-\hat{p}) \geq 5$ B. Any n C. n > 30 D. Small n

2. The test statistic for proportion $z = (\hat{p} - p_0) / \sqrt{[p_0(1-p_0)/n]}$ uses p_0 in the denominator because: A. Convenience B. It follows H_0 C. Reduces error D. Unknown
3. A CI for p widens when: A. n decreases B. $\hat{p}$ near 0.5 C. n increases D. $\hat{p}$ near 0 or 1 with small n
4. Degrees of freedom in a proportion test: A. $n - 1$ B. n C. Not applicable D. $n - k$
5. If p-value > α → A. Reject H_0 B. Fail to reject H_0 C. Type I error D. Type II error
6. The probability that the sample $\hat{p}$ exceeds p_0 when H_0 is true equals… A. α/2 B. < α C. p-value D. Depends
7. A 90 % CI is shorter than a 95 % CI because: A. z is smaller B. z is larger C. s^2 is smaller D. n is larger
8. For $\hat{p} = 0.4$, n = 100, the SE ≈ A. 0.04 B. 0.049 C. 0.06 D. 0.50
9. Increasing sample size helps to: A. Reduce SE B. Lower Type II error C. Boost power D. All of these
10. If 0 is **not** inside a CI for $p_1 - p_2$, conclude: A. $p_1 \neq p_2$ B. $p < 0$ C. $p > 0$ D. Independence test
11. A **chi-square** test of a contingency table examines _____. A. Goodness-of-fit B. Independence C. Multivariate fit D. B & C
12. Hints of rejecting H_0 include: A. A huge test statistic B. Small p-value C. Value falls in rejection region D. All of these
13. When n is small & p near 0 or 1, use _____ instead of z. A. Continuity correction B. Fisher's exact test C. t-test D. F-test
14. Required n for a CI length L when p ~ 0.5: A. $n \approx z^2 / (L^2/4)$ B. $L = z\sqrt{(pq/n)}$ C. n < 30 D. Irrelevant
15. For a one-tailed test at α = 0.05, the critical z ≈ A. 1.64 B. 1.96 C. 2.33 D. 2.58
16. Poisson approximation for binomial-based CI is valid when: A. Large n, small p B. $np \geq 5$ C. $p \approx 0.5$ D. Never

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Topic 10 – Review of Topics 1–9 (20 Qs)

1. The z-score of 70 when μ = 60 and σ = 5 is: A. 1 B. 2 C. −2 D. 0
2. In a normal distribution, P(|Z| > 1) is approximately: A. 0.16 B. 0.32 C. 0.68 D. 0.84
3. The median of 3, 5, 7, 9, 11 is: A. 5 B. 7 C. 8 D. 9
4. The range of 4, 4, 6, 8, 10 is: A. 6 B. 4 C. 10 D. 8
5. For $\hat{p} = 0.60$ and n = 100, the standard error SE ≈: A. 0.024 B. 0.049 C. 0.060 D. 0.400
6. If mean = mode > median, the distribution is: A. Right-skewed B. Left-skewed C. Symmetric D. Undetermined
7. Degrees of freedom when computing sample variance with n = 12 is: A. 10 B. 11 C. 12 D. 13
8. Given P(A) = 0.5, P(B) = 0.3 and independence, $P(A \cap B)$ = A. 0.15 B. 0.20 C. 0.30 D. 0.80
9. For n = 128, Sturges' rule suggests K ≈: A. 6 B. 7 C. 8 D. 10
10. If X ~ Poisson(λ = 3), then Var(X) = A. 1 B. 3 C. 6 D. 9
11. Given $\bar{x} = 20$ and s = 4, the CV = A. 0.20 B. 0.40 C. 5 D. 20
12. In a normal distribution, mean ± 3 σ covers ≈ A. 95 % B. 97.5 % C. 99.7 % D. 100 %
13. If P(A) = 0 then A is a(n) _____ event. A. Certain B. Impossible C. Independent D. Random
14. Adding a very large outlier to a sample makes the mean: A. Increase B. Decrease C. Unchanged D. Equal to median
15. When all observations are identical, the IQR equals: A. 0 B. The range C. s^2 D. Infinite
16. Rolling two dice, the probability the sum equals 7 is: A. 1/36 B. 1/18 C. 1/12 D. 1/6
17. The central limit theorem says $\bar{X}$ tends toward a _____ when n is large. A. Normal B. Poisson C. Exponential D. Hypergeometric
18. In a two-tailed test with α = 0.05, each tail has area: A. 0.05 B. 0.025 C. 0.10 D. 0.95

19. The proportion of observations with z-score > 0 in a normal distribution is:
    A. 25 % B. 50 % C. 68 % D. 95 %
20. With $n_1 = 20$, $\bar{x}_1 = 50$; $n_2 = 30$, $\bar{x}_2 = 60$, the pooled mean = A. 54 B. 55 C. 56 D. 57

ANSWER KEY

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