

National Testing Agency

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Biostatistics and Mathematical Biology

Group Number :	1
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Edit Attended Group? :	No
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Is this Group for Examiner? :	No

Biostatistics and Mathematical Biology-1

Section Id :	512452776
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	512452779
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 51245212141 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Consider the following proposition: "There only three domains in biological classification, as the world authority of taxonomy Carl Woes from United States said so." This argument is an example of:

1. *Ignoratio elenchi*
2. *Argumentum ad hominem*
3. *Argumentum ad antiquitatem*
4. *Argumentum as verecundiam*

Options :

- 51245236941. 1
- 51245236942. 2
- 51245236943. 3
- 51245236944. 4

Question Number : 2 Question Id : 51245212142 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

To study the effect of climate change on the flora of Antarctica, floristic maps and species occurrence data of the continent from 1900s till date were compared. This is an example of:

1. Retrospective study
2. Prospective study
3. Case-control study
4. Randomized Control trial

Options :

- 51245236945. 1
- 51245236946. 2
- 51245236947. 3
- 51245236948. 4

Question Number : 3 Question Id : 51245212143 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is the listing of values of the variable together with the proportion of observations less than or equal to that value?

1. Empirical Frequency Distribution (EFD)
2. Empirical Relative Frequency Distribution (ERFD)
3. Empirical Cumulative Distribution (ECD)
4. Contingency Table

Options :

- 51245236949. 1
- 51245236950. 2
- 51245236951. 3
- 51245236952. 4

Question Number : 4 Question Id : 51245212144 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Age is an example of:

1. Dependent variable
2. Independent variable
3. Discrete variable
4. Qualitative variable

Options :

- 51245236953. 1
- 51245236954. 2
- 51245236955. 3
- 51245236956. 4

Question Number : 5 Question Id : 51245212145 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following is used to depict process of evolution?

1. 3 D doughnut plots
2. Surface plots
3. Dynamite plunger plot
4. Phylogenetic tree

Options :

- 51245236957. 1
- 51245236958. 2
- 51245236959. 3
- 51245236960. 4

Question Number : 6 Question Id : 51245212146 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the sample size is > 100 , which among the following graphical summarization is the best?

1. Box and whisker plot
2. 3D doughnut plot
3. Heatmap depicting expression levels
4. Line plot

Options :

- 51245236961. 1
- 51245236962. 2
- 51245236963. 3

51245236964. 4

Question Number : 7 Question Id : 51245212147 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

To compare scatter of two groups from normal distribution, which of the following error bars is appropriate?

1. Mean \pm SD
2. Mean \pm SEM
3. Mean \pm 95% CI of the mean
4. Median \pm MAD

Options :

- 51245236965. 1
- 51245236966. 2
- 51245236967. 3
- 51245236968. 4

Question Number : 8 Question Id : 51245212148 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Repeated measurements to increase the accuracy are called:

1. Technical Replicates
2. Pseudoreplicates
3. Biological replicates
4. Bootstrap replicates

Options :

- 51245236969. 1
- 51245236970. 2
- 51245236971. 3
- 51245236972. 4

Question Number : 9 Question Id : 51245212149 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Peakedness of the distribution is quantified by which of the following?

1. Skewness
2. Kurtosis
3. D'Agostino-Pearson omnibus K2 normality test
4. ROUT method

Options :

- 51245236973. 1

51245236974. 2

51245236975. 3

51245236976. 4

Question Number : 10 Question Id : 51245212150 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A test to detect one outlier in the dataset is:

1. Skewness
2. Kurtosis
3. D'Agostino-Pearson omnibus K2 normality test
4. Grubb's test

Options :

51245236977. 1

51245236978. 2

51245236979. 3

51245236980. 4

Question Number : 11 Question Id : 51245212151 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If 95% Confidence Intervals does not include Null Hypothesis:

1. $P > 0.01$
2. $P < 0.05$
3. $P > 0.05$
4. $P < 0.01$

Options :

51245236981. 1

51245236982. 2

51245236983. 3

51245236984. 4

Question Number : 12 Question Id : 51245212152 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Accepting the false null hypothesis is called:

1. Type I error
2. Type II error
3. Type III error
4. False Positive

Options :

- 51245236985. 1
- 51245236986. 2
- 51245236987. 3
- 51245236988. 4

Question Number : 13 Question Id : 51245212153 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following tests is used for matched measurements for more than two groups?

- 1. Two-way ANOVA
- 2. Type-II ANOVA
- 3. Random effects ANOVA
- 4. Repeated measures ANOVA

Options :

- 51245236989. 1
- 51245236990. 2
- 51245236991. 3
- 51245236992. 4

Question Number : 14 Question Id : 51245212154 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following tests measures homoscedasticity?

- 1. Paired t-test
- 2. Independent t-test
- 3. Linear regression
- 4. F-test

Options :

- 51245236993. 1
- 51245236994. 2
- 51245236995. 3
- 51245236996. 4

Question Number : 15 Question Id : 51245212155 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

χ^2 Test of Independence is an example of:

- 1. Correlation
- 2. Regression
- 3. Model fitting
- 4. ANOVA

Options :

- 51245236997. 1
- 51245236998. 2
- 51245236999. 3
- 51245237000. 4

Question Number : 16 Question Id : 51245212156 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following tests is used to bring out patterns of clustering if you have a very large number of variables?

- 1. Pearson's Correlation
- 2. Simple linear regression
- 3. Nonlinear regression
- 4. Principal Component Analysis

Options :

- 51245237001. 1
- 51245237002. 2
- 51245237003. 3
- 51245237004. 4

Question Number : 17 Question Id : 51245212157 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following tests is used for correcting influences of confounding variables to the main outcome variable?

- 1. Pearson's Correlation
- 2. Simple linear regression
- 3. Multiple regression
- 4. Principal Component Analysis

Options :

- 51245237005. 1
- 51245237006. 2
- 51245237007. 3
- 51245237008. 4

Question Number : 18 Question Id : 51245212158 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Instead of triplet codons, assume that it is only doublet. In that case, how many codons are possible?

1. 10
2. 4
3. 8
4. 16

Options :

51245237009. 1
51245237010. 2
51245237011. 3
51245237012. 4

Question Number : 19 Question Id : 51245212159 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

1% of women have breast cancer in Bathinda. 80% of mammograms detect breast cancer when it is there (and therefore 20% miss it). 9.6% of mammograms detect breast cancer when it's not there (and therefore 90.4% correctly return a negative result). Now suppose you get a positive test result. What are the chances you have cancer?

1. 8%
2. 80%
3. 98%
4. 89%

Options :

51245237013. 1
51245237014. 2
51245237015. 3
51245237016. 4

Question Number : 20 Question Id : 51245212160 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following is Likelihood?

1. $P(M|D)$
2. $P(D|M)$
3. $P(D) \times P(M)$
4. $P(D|M) \times P(M)/P(D)$

Options :

51245237017. 1
51245237018. 2
51245237019. 3
51245237020. 4

Biostatistics and Mathematical Biology-2

Section Id :	512452777
Section Number :	2
Section type :	Offline
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	30
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	512452780
Question Shuffling Allowed :	No

Question Number : 21 Question Id : 51245212161 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain False dichotomy.

Question Number : 22 Question Id : 51245212162 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Confidence Interval.

Question Number : 23 Question Id : 51245212163 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Straw man fallacy.

Question Number : 24 Question Id : 51245212164 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain GIGO principle.

Question Number : 25 Question Id : 51245212165 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Hawthorne effect.

Question Number : 26 Question Id : 51245212166 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Standard Error of the Mean.

Question Number : 27 Question Id : 51245212167 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Box and whisker plot.

Question Number : 28 Question Id : 51245212168 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Levels of measurements.

Question Number : 29 Question Id : 51245212169 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Continuous Variables vs. Discrete Variable.

Question Number : 30 Question Id : 51245212170 Question Type : SUBJECTIVE

Correct Marks : 3

Briefly explain Parametric vs. Non-parametric statistics.

Biostatistics and Mathematical Biology-3

Section Id :	512452778
Section Number :	3
Section type :	Offline
Mandatory or Optional :	Mandatory
Number of Questions :	7
Number of Questions to be attempted :	5
Section Marks :	50
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	512452781
Question Shuffling Allowed :	No

Question Number : 31 Question Id : 51245212171 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Tukey's HSD

Question Number : 32 Question Id : 51245212172 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Wilcoxon matched-pairs signed-rank test

Question Number : 33 Question Id : 51245212173 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Independent t-Test

Question Number : 34 Question Id : 51245212174 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Omnibus K2 test

Question Number : 35 Question Id : 51245212175 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Mann-Whitney U Test

Question Number : 36 Question Id : 51245212176 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Grubb's test

Question Number : 37 Question Id : 51245212177 Question Type : SUBJECTIVE

Correct Marks : 10

Explain the following test with an example, test's utility and interpretation of test's P values.

Chi-square test