

1. The function of  $\beta$  subunit of polymerase is

- a. Template binding
- b. Catalytic binding**
- c. Promoter binding
- d. Cation binding

2. Which of the  $\sigma$  factors is heat stable?

- a.  $\sigma^{54}$
- b.  $\sigma^{70}$
- c.  $\sigma^{28}$
- d.  $\sigma^{32}$**

3. The mRNA codon of valine is

- a. GUC**
- b. UGG
- c. CCA
- d. TTG

4. True replication of DNA is due to

- a. Phosphate backbone
- b. Hydrogen bonding
- c. Complementary base pairing rule**
- d. None

5. Which of the following statements is not applicable to viruses?

- a. The virus replicates in a bacterial host
- b. The protein coat of a virus does not enter the host cell
- c. The genetic material is DNA or RNA
- d. Virus replicate autonomously in the absence of host

6. Mode of DNA replication is

- a. Conservative and bidirectional
- b. Semiconservative and unidirectional
- c. Semiconservative and bidirectional**
- d. Conservative and unidirectional.

7. Which enzyme is used to join nicks in the DNA strand?

- a. Primase
- b. DNA polymerase
- c. DNA ligase**
- d. Endonuclease

8. Which enzyme is used in the unwinding of DNA?

- a. Ligase
- b. Topoisomerase

- c. **Helicase**
- d. Exonuclease

9. Which of the following processes does not occur in prokaryotes?

- a. Transcription
- b. **Splicing**
- c. Translation
- d. Replication

10. cDNA is synthesised from RNA by the enzyme

- a. DNA polymerase
- b. DNA synthetase
- c. DNA convertase
- d. **Reverse transcriptase**

11. Which of the following base-pairing rule is correct?

- a. Adenine with guanine and thymine with cytosine
- b. DNA base pairing is non-specific
- c. Adenine with cytosine and guanine with thymine
- d. **Adenine with thymine and guanine with cytosine**

12. DNA synthesis can be measured by estimating the incorporation of radiolabelled

- a. **Thymine**
- b. Guanine
- c. Cytosine
- d. Adenine

13. How many RNA polymerases are present in a bacterial system?

- a. 4
- b. 2
- c. **1**
- d. 3

14. During DNA replication the synthesis of the leading strand of DNA results in fragments known as

- a. **Okazaki fragments**
- b. Satellite segments
- c. Kornberg segment
- d. Double-helix segment

15. Short strands of --- primer are used in DNA replication.

- a. DNA
- b. **RNA**
- c. Histone
- d. Protein

16. The tendency of an offspring to resemble its parent is known as
- Variation
  - Heredity**
  - Resemblance
  - Inheritance
17. Who is known as the "Father of Genetics"?
- Morgan
  - Mendel**
  - Watson
  - Bateson
18. The alternate form of a gene is
- Alternate type
  - Recessive character
  - Dominant character
  - Allele**
19. The genotypic ratio of a monohybrid cross is
- 1:2:1**
  - 3:1
  - 2:1:1
  - 9:3:3:1
20. The crossing of F1 to either of the parents is known as
- Test cross
  - Back cross**
  - F1 cross
  - All of the above
21. Which of the following statements is true regarding the "law of segregation"?
- Law of segregation is the law of purity of genes
  - Alleles separate from each other during gametogenesis
  - Segregation of factors is due to the segregation of chromosomes during meiosis
  - All of the above**
22. Homozygosity and heterozygosity of an individual can be determined by
- Back cross
  - Self-fertilization
  - Test cross**
  - All of the above
23. An exception to Mendel's law is
- Independent assortment
  - Linkage**
  - Dominance

- d. Purity of gametes
24. Pea plants were used in Mendel's experiments because
- They were cheap
  - They had contrasting characters**
  - They were available easily
  - All of the above
25. The smallest unit of genetic material which produces a phenotypic effect on mutation is
- Muton**
  - Gene
  - Recon
  - Nucleic acid
26. Mendel's findings were rediscovered by
- Correns
  - De Vries
  - Tschermak
  - All**
27. Alleles are
- Alternate forms of genes**
  - Linked genes
  - Chromosomes that have crossed over
  - Homologous chromosomes
28. When the activity of one gene is suppressed by the activity of a non-allelic gene, it is known as
- Pseudo-dominance
  - Hypostasis
  - Epistasis**
  - Incomplete dominance
29. Cystic fibrosis is
- Sex-linked recessive disorder
  - Autosomal dominant disorder
  - Autosomal recessive disorder**
  - Sex-linked dominant disorder
30. 9:7 ratio in the F<sub>2</sub> generation represents
- Incomplete dominance
  - Co-dominance
  - Epistasis**
  - Complementary interaction
31. A small amount of lethal mutation is always present in the population due to

- a. Positive selection
- b. Negative selection
- c. Frequency-dependent selection
- d. Mutation-selection balance**

32. If a plant with genotype AaBb is self-fertilized, the probability of getting AABB genotype will be (A and B are not linked)

- a.  $\frac{1}{2}$
- b.  $\frac{1}{4}$
- c.  $\frac{1}{8}$
- d.  $\frac{1}{16}$**

33. How many phenotypes can occur in the human blood group ABO with alleles  $I^A I^B i$ ?

- a. 2
- b. 3
- c. 4**
- d. 1

34. The geometrical device that helps to find out all the possible combinations of male and female gametes is known as

- a. Bateson Square
- b. Mendel Square**
- c. Punnett Square**
- d. Mendel's Cube

35. Which term represents a pair of contrasting characters?

- a. Heterozygous
- b. Homozygous
- c. Codominant genes
- d. Allelomorphs**

36. Restriction enzymes were discovered by

- a. Smith and Nathans**
- b. Alexander Fleming
- c. Berg
- d. None

37. Bacteria protect themselves from viruses by fragmenting viral DNA with

- a. Ligase
- b. Endonuclease**
- c. Exonuclease
- d. Gyrase

38. Klenow fragment is derived from

- a. DNA Ligase
- b. DNA Pol-I**

- c. DNA Pol-II
- d. Reverse Transcriptase

39. Southern blotting is

- a. Attachment of probes to DNA fragments
- b. Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet**
- c. Comparison of DNA fragments to two sources
- d. Transfer of DNA fragments to electrophoretic gel from cellulose membrane

40. ELISA is

- a. Using radiolabelled second antibody
- b. Usage of RBCs
- c. Using complement-mediated cell lysis
- d. Addition of substrate that is converted into a coloured end product**

41. The Golden Rice variety is rich in

- a. Vitamin C
- b. B-carotene and ferritin**
- c. Biotin
- d. Lysine

42. The DNA fragments have sticky ends due to

- a. Endonuclease
- b. Unpaired bases**
- c. Calcium ions
- d. Free methylation

43. Plasmids are used as cloning vectors for which of the following reasons?

- a. Can be multiplied in culture
- b. Self-replication in bacterial cells**
- c. Can be multiplied in laboratories with the help of enzymes
- d. Replicate freely outside bacterial cells

44. The human genome project was launched in the year

- a. 1980
- b. 1973
- c. 1990**
- d. 1989

45. The vaccines prepared through recombinant DNA technology are

- a. Third generation vaccines**
- b. First-generation vaccines
- c. Second-generation vaccines
- d. None

46. Which is a genetically modified crop?

- a. Bt-cotton
- b. Bt-brinjal
- c. Golden rice
- d. **All**

47. PCR technique was invented by

- a. **Kary Mullis**
- b. Boyer
- c. Sanger
- d. Cohn

48. The first transgenic plant to be produced is

- a. Brinjal
- b. **Tobacco**
- c. Rice
- d. Cotton

49. RNA interference helps in

- a. Cell proliferation
- b. Micropropagation
- c. **Cell defence**
- d. Cell differentiation

50. Which of the following is the quality of improved transgenic basmati rice?

- a. Gives high yield but no characteristic aroma
- b. **Gives high yield and is rich in vitamin A**
- c. Does not require chemical fertilizers and growth hormones
- d. Resistant to insects and diseases

51. The first clinical application of gene therapy over a 4 year old girl was for

- a. **Adenosine deaminase deficiency**
- b. Adenosine deficiency
- c. Growth deficiency
- d. Adenine deficiency

52. Excision and insertion of a gene is called

- a. Biotechnology
- b. **Genetic engineering**
- c. Cytogenetics
- d. Gene therapy

53. The expression of a transgene in the target tissue is identified by a

- a. Transgene
- b. Promoter
- c. Enhancer
- d. Reporter

54. ——— is used as a vector for cloning into higher organisms
- Retrovirus**
  - Baculovirus
  - Salmonella typhimurium*
  - Rhizopus nigricans*
55. Which bacterium is used in the production of insulin by genetic engineering?
- Saccharomyces*
  - Rhizobium*
  - Escherichia**
  - Mycobacterium*
56. What is true about Machine Learning?
- Machine Learning (ML) is that field of computer science
  - ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method.
  - The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention.
  - All of the above**
57. ML is a field of AI consisting of learning algorithms that?
- Improve their performance
  - At executing some task
  - Over time with experience
  - All of the above**
58. When the size of data is large enough such that it cannot be processed on a single machine, it is called as
- Big data**
  - Single data
  - Machine data
  - None of the above
59. A popular method to reduce dimensionality of data is
- Decision trees
  - Random forests
  - Principal component analysis**
  - All of the above
60. The synonym(s) for the word attribute is
- Instance
  - Dimension
  - Variable
  - Both B and C**
61. Which of the following is deterministic algorithm
- Genetic programming**



- b. Particle swarm optimization
  - c. Decision trees
  - d. All of the above
62. Hadoop is a framework for
- a. Distributed computing
  - b. Parallel processing
  - c. Machine learning algorithms
  - d. **Both A and B**
63. We can transform any data to normality by using
- a. MS Excel
  - b. Decision tree
  - c. **Log**
  - d. None of the above
64. In a distributed file system, data is divided into small pieces of equal size know as
- a. Replication
  - b. **Block size**
  - c. Translation
  - d. All of the above
65. The ability of a model to successfully predict the unseen data is known as
- a. **Robustness**
  - b. Agility
  - c. Coverage
  - d. None of the above
66. Which of the following is a stochastic algorithm
- a. **Genetic programming**
  - b. Decision trees
  - c. Naïve bayes
  - d. Support vector machines
67. If we already have a historical data that contains the set of outputs for a set of inputs, then the learning based on this data is called as
- a. Unsupervised learning
  - b. **Supervised learning**
  - c. Deep learning
  - A. All of the above
68. Clustering is an example of
- a. Deep learning
  - b. Supervised learning
  - c. **Unsupervised learning**
  - d. Reinforcement learning
69. The machine learning technique involving feedback from the environment is called as
- a. Deep learning
  - b. Decision trees
  - c. Supervised learning
  - d. **Reinforcement learning**
70. A machine learning method where a model developed for a task is reused as the starting point for a model on a second task

- a. Deep learning
  - b. Reinforcement learning
  - c. Transfer learning**
  - d. None of the above
71. What is the main role of Statistical functions, principles, and algorithms?
- a. to analyze raw data
  - b. build a Statistical Model
  - c. predict the result
  - d. All of the above**
72. The Statistics makes inferences and predictions about a population based on a sample of data taken from the population in question.
- a. Descriptive
  - b. Quantitative
  - c. Inferential**
  - d. Qualitative
73. The value most recurrent in the sample set is known as
- a. Mean
  - b. Median
  - c. Mode**
  - d. Standard Deviation
74. Result disproves the assumption is known as?
- a. Null Hypothesis
  - b. Alternate Hypothesis**
  - c. Immediate Hypothesis
  - d. All of the above
75. It is the measure of variability, based on dividing a data set into quartiles.
- a. Deviation
  - b. Standard Deviation
  - c. Range
  - d. Inter Quartile Range**
76. Data Analysis is a process of?
- a. Inspecting data
  - b. Cleaning data
  - c. Transforming data
  - d. All of the above**
77. Which of the following is true about regression analysis?
- a. answering yes/no questions about the data
  - b. estimating numerical characteristics of the data
  - c. modeling relationships within the data**
  - d. describing associations within the data
78. Text Analytics, also referred to as Text Mining?
- a. TRUE**
  - b. FALSE
  - c. Can be true or false
  - d. Can not say
79. The goal of business intelligence is to allow easy interpretation of large volumes of data to identify new opportunities.

- a. **TRUE**
  - b. FALSE
  - c. Can be true or false
  - d. Can not say
80. Which of the following is true about hypothesis testing?
- a. **Answering yes/no questions about the data**
  - b. Estimating numerical characteristics of the data
  - c. Describing associations within the data
  - d. Modeling relationships within the data
81. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?
- a. Decision Tree
  - b. Naïve Bayes
  - c. Classification
  - d. **Random Forest**
82. The disadvantage of decision trees is
- a. **Overfitting**
  - b. Feature selection
  - c. Dimensionality reduction
  - d. Information gain
83. We can handle missing or corrupted data in a dataset?
- a. Drop missing rows or columns
  - b. Replace missing values with mean/median/mode
  - c. Assign a unique category to missing values
  - d. **All of the above**
84. When performing regression or classification, which of the following is the correct way to preprocess the data?
- a. **Normalize the data -> PCA -> training**
  - b. PCA -> normalize PCA output -> training
  - c. Normalize the data -> PCA -> normalize PCA output -> training
  - d. None of the above
85. Which one of the following is used to define the structure of the relation ,deleting relations and relating schemas ?
- a. DML(Data Manipulation Language)
  - b. **DDL(Data Definition Language)**
  - c. Query
  - d. Relational Schema
86. DBMS is an interface between
- a. Database and User
  - b. **Database application and database**
  - c. Database and SQL
  - d. Data and Database
87. Which of the following is an advantage of database management approach?
- a. Data is dependent on programs
  - b. Data redundancy increases
  - c. **Data can be accessed by multiple programs**
  - d. Multiple users cannot access data concurrently

88. A relationship among a set of values in a table is represented by a
- Relation
  - Column
  - Row**
  - Attributes
89. Entity is a \_\_\_\_\_
- Object of relation
  - Present working model
  - Thing in real world**
  - Model of relation
90. Every weak entity set can be converted into a strong entity set by:
- using generalization
  - adding appropriate attributes**
  - using aggregation
  - none of the above
91. E-R modeling technique is a :
- Top-down approach**
  - Bottom-up approach
  - Left-right approach
  - None of the above
92. In ER model the details of the entities are hidden from the user. This process is called :
- generalization
  - specialization
  - abstraction**
  - none of these above
93. The attribute AGE is calculated from DATE\_OF\_BIRTH. The attribute AGE is
- Single valued
  - Multi valued
  - Composite
  - Derived**
94. Which of the following can be a multivalued attribute?
- Phone\_number**
  - Name
  - Date\_of\_birth
  - All of the mentioned
95. Which of the following is a single valued attribute?
- Register\_number**
  - Address
  - SUBJECT\_TAKEN
  - Reference
96. A weak entity set in an E-R diagram is an entity set that :
- has a primary key
  - must be part of a one to many relationship set**
  - is not existence dependent on a dominant entity
  - must not participate as owner in an identifying relationship with another entity set

97. The number of entities to which another entity can be associated via a relationship set is expressed as :
- Entity
  - Cardinality**
  - Schema
  - Attributes
98. The attributes made up of more than one single attributes are called
- Composite attribute**
  - Derived attribute
  - Single value attribute
  - Multi value attribute
99. An association of several entities in an Entity-Relation model is called :
- Tuple
  - Record
  - Relationship**
  - Field
100. A functional dependency is a relationship between or among
- Entities
  - Rows
  - Attributes**
  - Tables
101. The database design prevents some data from being stored due to \_\_\_\_\_.
- Deletion anomalies
  - Insertion anomalies**
  - Update anomalies
  - Selection anomalies
102. Cybersecurity is primarily about ?
- people
  - processes
  - technologies
  - All of the above**
103. Cybersecurity also be referred to as?
- incident security
  - information technology security**
  - internet security
  - threat security
104. Which of the following is one of the Cyber Security Goals?
- Protect the confidentiality of data.
  - Preserve the integrity of data
  - Promote the availability of data for authorized users
  - All of the above**
105. Which of the following are data security consideration?
- Backups
  - Archival Storage
  - Disposal of Data
  - All of the above**
106. the process of retaining or keeping of data at a secure place for long-term storage.

- a. **Data archiving**
  - b. Archival Storage
  - c. Disposal of Data
  - d. Backup
107. Which of the following are objectives of Malware?
- a. Provide remote control for an attacker to use an infected machine.
  - b. Investigate the infected user's local network.
  - c. Steal sensitive data.
  - d. **All of the above**
108. Malware is short form of ?
- a. malicious hardware
  - b. **malicious software**
  - c. Both A and B
  - d. None of the above
109. Which of the following is a programs that copy themselves throughout a computer or network?
- a. Worms
  - b. Trojans
  - c. **Viruses**
  - d. Rootkits
110. Which of the following malware do not replicate or reproduce through infection?
- a. Worms
  - b. **Trojans**
  - c. Viruses
  - d. Rootkits
111. Which malware has Short for "robot network"?
- a. ronets
  - b. **botnets**
  - c. botwork
  - d. rowork
112. Which malware enable administrative control, allowing an attacker to do almost anything on an infected computer?
- a. Rootkits
  - b. **RATs**
  - c. Botnets
  - d. Worms
113. Which malware are often the armies behind today's distributed denial-of-service (DDoS) attacks?
- a. **Botnets**
  - b. botnetsSpyware
  - c. Trojans
  - d. Viruses
114. A digital signature is a mathematical technique which validates?
- a. authenticity
  - b. integrity
  - c. Non-repudiation
  - d. **All of the above**

115. The process which verifies the identity of a user who wants to access the system.

- a. **Authentication**
- b. Non-repudiation
- c. Integrity
- d. None of the above

116. Which of the following is an example of Homology and similarity tool?

(a) **BLAST**

(b) RasMol

(c) EMBOSS

(d) PROSPECT

117. In which year did the SWISSPROT protein sequence database begin?

(a) 1988

(b) 1985

(c) 1986

(d) **1987**

118. Which of the following scientists created the first Bioinformatics database?

(a) **Dayhoff**

(b) Pearson

(c) Richard Durbin

(d) Michael.J.Dunn

119. The human genome contains approximately\_\_\_\_\_.

(a) 6 billion base pairs

(b) 5 billion base pairs

(c) **3 billion base pairs**

(d) 4 billion base pairs

120. Which of the following tools is used for the identification of motifs?

(a) BLAST

(b) **COPIA**

(c) PROSPECT

(d) Pattern hunter

121. The first molecular biology server expasy was in the year \_\_\_\_\_.

(a) 1992

(b) **1993**

(c) 1994

(d) 1995

122. What is the deposition of cDNA into the inert structure called?

- (a) DNA probes
- (b) DNA polymerase
- (c) **DNA microarrays**
- (d) DNA fingerprinting

123. The identification of drugs through the genomic study is called\_\_\_\_\_.

- (a) Genomics
- (b) **Pharmacogenomics**
- (c) Pharmacogenetics
- (d) Cheminformatics

124. Which of the following compounds has desirable properties to become a drug?

- (a) Fit drug
- (b) **Lead**
- (c) Fit compound
- (d) All of the above

125. Proteomics refers to the study of \_\_\_\_\_.

- (a) Set of proteins in a specific region of the cell
- (b) Biomolecules
- (c) Set of proteins
- (d) **The entire set of expressed proteins in the cell**

126. The process of finding the relative location of genes on a chromosome is called \_\_\_\_\_.

- (a) Gene tracking
- (b) Genome walking
- (c) **Genome mapping**
- (d) Chromosome walking

127. The computational methodology that tries to find the best matching between two molecules, a receptor and ligand are called \_\_\_\_\_.

- (a) Molecular fitting
- (b) Molecular matching
- (c) **Molecular docking**
- (d) Molecule affinity checking

128. Which of the following are not the application of bioinformatics?

- (a) Drug designing
- (b) Data storage and management
- (c) Understand the relationships between organisms



(d) **None of the above**

129. The term "invitro" is the Latin word which refers to\_\_\_\_\_.

- (a) Within the lab
- (b) **Within the glass**
- (c) Outside the lab
- (d) Outside the glass

130. The stepwise method for solving problems in computer science is called\_\_\_\_\_.

- (a) Flowchart
- (b) **Algorithm**
- (c) Procedure
- (d) Sequential design

131. The term Bioinformatics was coined by \_\_\_\_\_.

- (a) J.D Watson
- (b) **Pauline Hogeweg**
- (c) Margaret Dayhoff
- (d) Frederic Sanger

132. The laboratory work using computers and associated with web-based analysis generally online is referred to as \_\_\_\_\_.

- (a) **In silico**
- (b) Dry lab
- (c) Wet lab
- (d) All of the above

133. Which of the following is the first completed and published gene sequence?

- (a) **ΦX174**
- (b) T4 phage
- (c) M13 phage
- (d) Lambda phage

134. The laboratory work using computers and computer-generated models generally offline is referred to as \_\_\_\_\_.

- (a) Insilico
- (b) Wet lab
- (c) **Dry lab**
- (d) All of the above

135. The computer simulation refers to \_\_\_\_\_.

- (a) Dry lab

(b) Invitro

(c) **In silico**

(d) Wet lab