

11. Myotonia congenita is caused by:
 A) Mutations affecting Chloride channel
 B) Mutations affecting Na K pump
 C) Mutations affecting passive transport
 D) None of these
12. P elements in Drosophila:
 Statement 1. Cause P M hybrid dysgenesis
 Statement 2. Used as vectors for Drosophila
- A) 1 and 2 are correct, and 1 is the correct explanation of 2
 B) 1 and 2 are correct and 1 is not the correct explanation of 2
 C) 1 is wrong and 2 is correct
 D) Both 1 and 2 are wrong
13. The deamination of 5 methyl cytosine results in:
 A) A- G transition
 B) G- A transition
 C) Replication block
 D) None of these
14. RB1 mutation causes cancer by:
 A) Loss of function
 B) Gain of function
 C) Forming fusion oncogenes
 D) None of the above
15. Uncompetitive inhibitor:
 A) Decreases K_m
 B) Decreases V_{max}
 C) Decreases both K_m and V_{max} .
 D) No change in K_m and V_{max}
16. Rate zonal centrifugation separates particles that differ in:
 A) Size but not density
 B) Density but not in size
 C) Both size and density
 D) Neither size nor density
17. The commonly used reference electrode in pH meter is ----- electrode.
 A) Sodium chloride
 B) Potassium chloride
 C) Silver chloride
 D) HCl
18. Relationship between absorbance (A) and transmittance (T) is:
 A) $A = 1/T$
 B) $A = 1 - T$
 C) $A = \log_{10} (1/T)$
 D) $A = - \log_{10} (1/T)$
19. In HPLC, peak area refers to the:
 A) Concentration of the compound
 B) Absorption maxima of the compound
 C) Retention time of the compound
 D) None of these
20. Which of the following compound release more energy upon hydrolysis?
 A) ATP
 B) GTP
 C) Creatine phosphate
 D) Glucose 6 phosphate

21. Lineweaver-Burk plot can be used for the:
 A) Analysis of bi-substrate reactions
 B) Analysis of enzyme inhibition
 C) Kinetic analysis
 D) All of the above
22. Philadelphia chromosome causes chronic myelogenous leukaemia.
 Statement 1. Philadelphia chromosome has ABL/ BCR fusion
 Statement 2. Philadelphia chromosome increases tyrosine kinase activity in cells
 A) Both 1 and 2 are correct and 1 is the correct explanation of 2
 B) Both 1 and 2 are correct and 2 is the correct explanation of 1
 C) Both 1 and 2 are wrong
 D) 1 is wrong and 2 is correct
23. *Triticum aestivum* is the bread wheat:
 Statement 1. Bread wheat is a fertile hexaploid.
 Statement 2. Bread wheat is an amphidiploid
 A) 1 is correct and 2 is wrong B) 1 is wrong and 2 is correct
 C) Both 1 and 2 are correct D) Both 1 and 2 are wrong
24. The perfect population size of a trihybrid cross is:
 A) 4 B) 16 C) 32 D) 64
25. Which among the following is **not** a natural gene transfer mechanism in bacteria?
 A) Transduction B) Transfection
 C) Conjugation D) Transformation
26. The drosophila genes which show criss cross inheritance:
 A) Red and white eye alleles
 B) Ebony and gray body alleles
 C) Spineless and normal bristle alleles
 D) Cherub and normal wing alleles
27. ----- affect the HW equilibrium.
 A) Large population B) Cross fertilisation
 C) Diploidy D) Natural selection
28. In a Hardy Weinberg population the individuals with AA genotype have a frequency of 0.49. Find out the frequency of heterozygotes in the population if AA, Aa and aa are the only genotypes in the population?
 A) 0.49 B) 0.7 C) 0.3 D) 0.42
29. Disinfectant inactivate or destroy microorganisms:
 A) within body B) on body
 C) on inert surfaces D) on and in food

30. Passive agglutination employs carrier particles that are coated with:
 A) soluble antigens B) particulate antigens
 C) antibodies D) epitopes
31. CD is cluster of:
 A) Differentiation B) Designation
 C) Both A and B D) Neither A nor B
32. Opsonins:
 A) Enhance phagocytosis B) Decrease phagocytosis
 C) Not affect phagocytosis D) Stop phagocytosis
33. Cholesterol is not present in:
 A) Most bacteria B) Influenza virus
 C) Cell membrane D) Endoplasmic reticular membrane
34. Reacting with Benedict's reagent, glucose is converted to:
 A) Glucuronic acid B) Gluconic acid
 C) Glucaric acid D) Cuprous oxide
35. An example for reversible kinase reaction is the reaction catalyzed by:
 A) Glucokinase B) Hexokinase
 C) Phosphoglycerate kinase D) Pyruvate kinase
36. At high glucose levels, fatty acid catabolism is inhibited by the inhibition of:
 A) carnitine acyl transferase by malony CoA
 B) fatty acyl CoA dehydrogenase by acetyl CoA
 C) acetyl CoA carboxylase
 D) thiolase
37. DNA glycosylases are involved in ---- repair.
 A) Nucleotide excision B) Mismatch
 C) Base excision D) Recombination
38. ----- has 5' to 3' exonuclease activity:
 A) Klenow enzyme B) DNA pol I
 C) DNA pol II D) DNA pol III
39. Find out the odd one:
 A) GTPase activating proteins
 B) Ras pathway
 C) Guanine nucleotide releasing proteins
 D) MAP kinases
40. How many different RNA polymerases are found in E coli?
 A) one B) two C) three D) fifteen
41. Find out the odd one:
 A) Scrapie B) C J D C) Ataxia D) Kuru

42. Find the **incorrect** match:
 A) Shine Delgarno and Kozak B) RBS and Kozak
 C) Promoter and TATA box D) Promoter and Shine Delgarno
43. Which of the following statement about the Promoter pSPAC is **wrong**?
 A) It is from phage SPO-I
 B) It can be induced by IPTG
 C) It can be repressed by lac repressor
 D) It is used for regulated expression of foreign genes in Pseudomonas putida
44. Find out the odd one:
 A) Topocloning technology B) BP clonase
 C) LR clonase D) Gateway technology
45. What is the biosafety level practices recommended for SARS covid -19?
 A) BSL-1 B) BSL-2 C) BSL-3 D) BSL-4
46. Recombinant hepatitis B vaccine is a preparation of:
 A) HBeAg B) HBvAg C) HBcAg D) HBsAg
47. HAT medium is composed of:
 A) hypoxanthine-aminoprotein-thymidine
 B) hypoxanthine-aminopterid-thymidine
 C) hypoxanthine-aminopterin-thymene
 D) hypoxanthine-aminopterin-thymidine
48. HGPRT is necessary for:
 A) The salvage synthesis of nucleic acids
 B) The denovo synthesis of nucleic acids
 C) Both A and B
 D) Neither A nor B
49. ELISA is:
 A) enzyme-linked infection assay
 B) enzyme-ligated immunosorbent assay
 C) enzyme-linked immunosorbent assay
 D) enzyme-linked immunosorbent activity
50. The BCG vaccine contains -----.
 A) Dead bacteria
 B) Live bacteria that have been weakened
 C) Live bacteria in its original form
 D) Bacterial products
51. TATA is:
 A) Tumor-Associated Transplantation Antibody
 B) Tumor-Associated Transplantation Antigen
 C) Tumor-Assisted Transplantation Antigen
 D) Tumor-Activated Transplantation Antigen

52. Which of the following antibody class significantly crosses the human placenta?
 A) IgG B) IgM C) IgA D) IgD
53. Which among the following statement correctly explains the autonomy argument against human cloning?
 A) It is playing God
 B) Each individual has the right to develop without interference
 C) Cloning destroys individuality
 D) Common morality is compromised in human cloning
54. Find out the odd one among the following thermostable polymerases:
 A) Taq polymerase B) Deep Vent polymerase
 C) Tli polymerase D) Pwo polymerase
55. Which statement among the following is wrong about pUC plasmids?
 A) It works by alpha complementation
 B) Recombinants can be identified by blue white screening
 C) It contains β lactamase gene
 D) It is based on pSC101 replicon
56. Select the correct statement?
 A) AFLP is a codominant marker
 B) RFLP is a PCR based marker
 C) SNP are codominant markers
 D) RAPD uses 20mer primers
57. Which among the following next generation sequencing protocol is **not** based on sequencing by synthesis:
 A) Pyrosequencing B) ABi- SoLiD
 C) Illumina D) Helicos
58. Which among the following is **not** true about oligonucleotide adapters for restriction end modification?
 A) They are formed by partially complementary oligos
 B) They do not have preformed sticky ends
 C) They do not require restriction digestion
 D) Methylase treatment is not required when we use adapters for modifying the restriction fragments
59. Statement 1. Metaplasia is the conversion of one tissue specific stem cell to another
 Statement 2. In transdifferentiation one differentiated cell type becomes another
 A) Both 1 and 2 are correct B) 1 is correct and 2 is wrong
 C) 1 is wrong and 2 is correct D) both 1 and 2 are wrong
60. SARS-CoV-2 is a ----- enveloped virus.
 A) double-stranded RNA B) single-stranded RNA
 C) single-stranded DNA D) double-stranded DNA

61. Chemo-lithotrophs gain energy from:
 A) reduced organic compounds
 B) all compounds
 C) reduced inorganic compounds
 D) photosynthesis
62. Penicillin kills susceptible bacteria by----- the transpeptidase.
 A) specifically activating B) specifically replacing
 C) specifically inhibiting D) specifically competing
63. Lysozyme acts by hydrolyzing the bond:
 A) between NAG and NAM B) between cell wall and cytoplasm
 C) peptidoglycan and cell wall D) peptidoglycan and cross linking peptide
64. Daily production of which of -----is greater than that of any other immunoglobulin class.
 A) Serum IgA B) Secretory IgA
 C) Serum IgM D) Secretory IgM
65. Paratope is a part of:
 A) Antibody B) Antigen C) MHC D) Complement
66. Alteplase is a recombinant form of----- activator.
 A) tissue IL-2 B) tissue INF
 C) tissue plasminogen D) tissue complement
67. The technique which is **not** used specifically for avoiding spurious PCR amplicons:
 A) Hotstart PCR B) Nested PCR
 C) Inverse PCR D) Touch down PCR
68. The protocol which is **not** used for screening expression libraries:
 A) Hybrid arrest translation B) Immunological screening
 C) South Western screening D) North Western Screening
69. Statement 1. callus is an undifferentiated tissue with differing ploidy
 Statement 2. callus differentiation leads to somaclonal variations
 A) Both 1 and 2 are correct and 1 is the correct explanation of 2
 B) Both 1 and 2 are correct and 2 is the correct explanation of 1
 C) Both 1 and 2 are wrong
 D) 2 is wrong and 1 is correct
70. Chloroplast transformation is advantageous because
 A) Biological containment of transgenes can be ensured
 B) Dosage effect for transgene expression is obtained
 C) Position effects can be minimised
 D) All of the above

71. ----- is an autosomal dominant disorder.
 A) Huntingtons diseaae
 B) Angelmann's Disease
 C) Duchene Muscular Dystrophy
 D) Cystic fibrosis
72. Which among the following intellectual properties come into existence as soon as invented without any further procedures?
 A) Copyright
 B) GI
 C) Trade mark
 D) Domain name
73. The geometric mean of 2 and 8 is:
 A) 2
 B) 8
 C) 6
 D) 4
74. The distance between the Cartesian points (2, 3) and (5, 7) is:
 A) 5
 B) 7
 C) 3
 D) 2
75. Mesosomes differ from inclusion bodies in:
 A) Structure
 B) Function
 C) Location
 D) All the above
76. Bacterial spores are rich in Calcium -----.
 A) dipicolinate
 B) dipalmate
 C) dicarbonate
 D) disulphate
77. According to Indian patent law the term of patent is for ----- of the parent
 A) Twenty years from the grant
 B) Twenty years from the application
 C) Fifteen years from the grant
 D) Fifteen years from the application
78. Which among the following statement is wrong?
 A) Genetically modified organisms are patentable in India
 B) India follows sui generis system of plant variety protection
 C) Plants are patentable in India
 D) India is not a member of UPOV
79. The form used for filing complete / Provisional specification of patent in India:
 A) Form 18
 B) Form 2
 C) Form 3
 D) Form 5
80. Select the correct alternative
 A) Trade mark can be used infinite period
 B) A design is protected as soon as it is drawn on a paper
 C) Copyright is one of the intellectual properties with shortest term of protection
 D) Copyright is given country wise
81. Budapest treaty is concerned with:
 A) Protection of plant varieties
 B) Copyright protection
 C) Deposit of microorganisms
 D) Protection of genetically modified organisms

82. Which among the following change has happened to Indian patent law after TRIPS?
 A) Change from process to product patent
 B) Change from Product to process patent
 C) Compulsory licencing of drugs is mandatory
 D) Term of patent is 14 years
83. The term petty patent is used for ----- patemnt.
 A) process B) product C) design D) utility
84. The major carrier of Salmonellosis:
 A) Meet & Egg B) Egg & Fish
 C) Fruit & Egg D) Fish & Egg
85. The organism responsible for bloody Bread
 A) Bacillus licheniformis B) Serratia marcescens
 C) Bacillus subtilis D) Rhizopus stolonifera
86. Find out the roots of the quadratic equation $x^2 + 5x + 6$.
 A) $-2, -3$ B) $2, -3$ C) $2, 3$ D) $-2, 3$
87. Find the sum of 100 terms of the arithmetic progression 2, 4, 6, -----.
 A) 1000 B) 10000 C) 10100 D) 11000
88. Aerobic method used for waste water treatment?
 A) Trickling filter B) Septic Tank
 C) USAB D) USSB
89. Industrial alcohol will be produced by using starter culture:
 A) Top yeast B) Middle yeast
 C) Feeder yeast D) Bottom yeast
90. The enzyme used for fruit juice clarification:
 A) Protease B) Amylase C) Pectinase D) Cellulase
91. The delayed ripening of tomato was created by----- gene.
 A) Altered B) Replaced C) Relocated D) Silenced
92. The organism is coming under GRAS status:
 A) E.coli B) Pseudomonas
 C) Lactobacillus D) Bacillus
93. Select the correct statement:
 A) Genes without a known function are not patentable
 B) Artificial celllines are not patentable
 C) Genetically altered sequences are not patentable
 D) All of the above statements are correct
94. Design office of India is situated in:
 A) Chennai B) Mumbai C) Delhi D) Kolkatha

95. The publication of the patent is done in India after ----months of application.
 A) 12 B) 18 C) 24 D) 6
96. Find out the odd one:
 A) RaxML B) Mr Bayes C) Paup* D) S- DIVA
97. Find the **wrong** statement:
 A) DDBJ is a Nucleic acid sequence bank
 B) Sequin is a stand alone platform for sequence submission
 C) BankIt is a stand alone platform for sequence submission
 D) For coding sequences submitted to GenBank, a PDB accession is created automatically
98. The Tree building algorithm based on distance matrix:
 A) UPGMA B) ML
 C) Maximum parsimony D) Bayesian
99. How many reading frames are found in a double stranded DNA?
 A) 3 B) 1 C) 2 D) 6
100. A box contains a large number of red and blue marbles. The proportion of blue marbles is 50%. A simple random sample of 100 marbles is drawn from the box. Then which among the following statements are false?
 A) The percentage of red marbles in the sample has an expected value of 50% with an SE of 5%
 B) The 5% measures the likely size of the chance error in the 50%
 C) The percentage of reds in the sample will be around 50% give or take 5% or so
 D) There is about 95% chance that the percentage of reds in the sample will be in the range from 40% to 60%
101. Chinese red rice is:
 A) Miso B) Natto C) Ang-kak D) Tempeh
102. The byproduct of dairy industry used as a carbon source in fermentation media:
 A) Whey B) Molasses C) Dextrin D) Corn steep
103. An example of sedimentary type of nutrient cycle is
 A) Nitrogen cycle B) Carbon cycle
 C) Phosphorous cycle D) None of the above
104. An algae which produce hydrogen gas
 A) Chlorella B) Spirogyra
 C) Chlamydomonas D) Spirulina
105. Radiant energy is converted to potential energy by:
 A) Consumers B) Producers
 C) Decomposers D) All of these

117. *Clostridium perfringens* poisoning is associated with:
A) Vegetables B) Meat product
C) Canned food D) Fish products
118. A die is rolled three times. Find the chance that the first roll is an ace, the second roll is a deuce and the third roll is a trey?
A) $1/6$ B) $1/12$ C) $1/216$ D) $1/18$
119. A deck of cards is shuffled and three cards are dealt. Find the chance that the first card is a King?
A) $1/13$ B) $1/52$ C) $1/26$ D) $4/51$
120. Statement 1. pcDNA is a plasmid with SV 40 origin of replication
Statement 2. pcDNA can replicate in murine celllines
- A) Both statements are true and 1 is the correct explanation of 2
B) Both statements are true but 1 is not the correct explanation of 2
C) Both statements are wrong
D) 1 is wrong but 2 is correct
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