14235 120 MINUTES

1. The biotechnological discovery that helps the body heal itself through the delivery of therapeutic cells
   A) Xenotransplantation B) Tissue engineering
   C) Gene therapy D) Both A& B

2. Which RNA molecules inside cells can turn off the activity of specific genes?
   A) RNAi B) dsRNA
   C) microRNA D) RNAg

3. How many micrograms of DNA are needed to make 100 µL of a 100 µg/ml solutions?
   A) 0.1µg B) 1.0µg
   C) 10µg D) 100µg

4. Electrophoresis is the separation of charged molecules in an electric field, this technique is used to determine
   A) The length of DNA fragments
   B) The molecular weight of specific proteins
   C) The isoelectric point of a protein
   D) All the above

5. Measurement of hippuric acid synthesis is an ideal test for assessing the
   A) Utilization of galactose B) Detoxification function of liver
   C) Water depletion in the body D) None of the above

6. Isohyet are the lines
   A) Joining areas of equal rainfall
   B) Joining areas of equal snowfall
   C) Joining areas of equal height
   D) Joining areas of equal sea level

7. During the conversion of nitrate to ammonia by the plants, reduction of nitrate to nitrite takes place in the first step in the presence of enzyme
   A) Flarin adenine dinucleotide B) Nitrate reductase
   C) Sucro-phosphorase D) Inulase

8. Burkitt's lymphoma is a type of cancer of
   A) RBC B) WBC
   C) Platelet D) Dentrite cells

9. The organ used to detect pheromones, chemical messengers that carry information between individuals of the same species, is called
   A) Kinesthetic sense organ B) Vomeronasal organ
   C) Proprioceptive organ D) Nociceptive organ

10. The maternal tissue which participates in the formation of placenta and which are expelled at birth are collectively called

A) Amniotic endoderm B) Decidua
C) Allantoic membrane D) Extra embryonic coelom

11. The following are some of the common diseases and theircauses in humans.Which of them are correctly matched?

i. Polio – RNA virus
ii. *Histosomamansoni* – Nematode
iii. *Clostridium tetani* – Firmicutes
iv. Hepatitis B – DNA virus

A) (i) & (ii) B) (i), (ii) & (iv)
C) (i), (iii) & (iv) D) (ii), (iii) & (iv)

12. What are all the chances of colour blind daughters and sons being born in a marriage of normal man marrying a normal woman whose father was colour blind?

A) All sons are normal and all daughters are colour blind
B) Both the sons and daughters are phentypically normal
C) All the sons are colour blind and all the daughters are normal
D) 50% sons are colour blind and all the daughters are phenotypically normal

13. An endocrine gland with ectodermal and mesodermal origin

A) Adrenal B) Epiphysis
C) Thyroid D) Parathyroid

14. Growth due to the activity of reserve cells is

A) Multiplicative growth B) Auxetic growth
C) Accretionary growth D) Exponential growth

15. Genetically dwarf plant is treated with gibberllic acid to make it equal to the tall plants and if it is then crossed to a genetically dwarf plant, the progeny will be

A) All tall plants B) All dwarf plants
C) 3:1 ratio D) 1:1 ratio

16. Cyanide is a very poisonous substance which inhibits the enzyme cytochrome oxidase by binding with the metal cofactor. This process is

A) Allosteric inhibition B) Competitive inhibition
C) Non competitive inhibition D) Feedback inhibition

17. Character which is not ofPlatyhelminthes

A) Triploblastic acoelomates
B) Unsegmented body
C) Flattened body with anterior-posterior ends and dorsal ventral sides
D) Alimentary canal with mouth and anus

18. The distance between the genes and frequency of linkage are
A) Equal B) Complementing
C) Directly proportional D) Inversely proportional

19. Gaucher's disease is associated with
A) Abnormal protein metabolism
B) Abnormal carbohydrate metabolism
C) Abnormal fat metabolism
D) Vitamin deficiency

20. Which type of cartilage forms the whole of the adult skeleton of cartilaginous fishes?
A) Fibrous cartilage B) Hyaline cartilage
C) Elastic cartilage D) None of the above

21. In how many cells the meiotic division takes place, if the total number of spermatids produced are 32
A) 32 B) 16
C) 8 D) 4

22. A short length of DNA molecule has 80 thymine and 80 guanine bases. The total number of nucleotide in the DNA fragment is
A) 80 B) 160
C) 320 D) 640

23. In heavy smokers the alveoli of the lungs are enlarged and damaged which reduces the surface area for the exchange of respiratory gases. This condition is called
A) Asthma B) Emphysema
C) Anosmia D) Bronchitis

24. In a population, the condition at which the rate of addition of new members is more than the rate of individuals lost indicates,
A) Zero population growth B) Declining growth
C) Fluctuating growth D) None of the above

25. Which law explains the reason for larger size acquired by a species in cold waters, while the same species in warm waters is smaller in size?
A) Jorden's rule B) Bergman's rule
C) Allen's rule D) Gloger's rule

26. The formation of Acetyl co-A from pyruvic acid is the result of
A) Oxidative decarboxilation B) Phosphorylation
C) Reduction D) Decarboxilation

27. Michaelis constant (Km) of an enzyme is
    A) The substrate concentration at which the reaction attains its maximum velocity
    B) The substrate concentration at which the reaction attains half its maximum velocity
    C) Maximum velocity of reaction
    D) Related to negative feedback of reaction

28. A diet rich in protein leads to the formation of more
    A) Salt and water B) Minerals
    C) Urea D) Amino acids

29. The mutation occur in the wobble base of a codon which has no change in the amino acid sequence is
    A) Same sense mutation B) Non sense mutation
    C) Mis sense mutation D) Frame shift mutation

30. There are three genes a, b, c.Percentage of crossing over between a and b is 20 %, b and c is 28 % and a and c is 8 %. What is the sequence of genes on chromosome?
    A) a,b,c B) b,a,c
    C) a,c,b D) None of these

31. DNA sequence is ATGCTTAG. What will be the sequence of m-RNA?
    A) UACGAAUC B) TUCGUUAC
    C) CATAGCAT D) UAGGUUTC

32. Lobmann's scheme of reactions are associated with
    A) Neural transmission B) Muscle contraction
    C) Eye vision D) None of these

33. Molecular events occurred during capacitation includes
    A) Lipid composition change in sperm membrane
    B) Lowering of membrane potential
    C) cAMP production is increased
    D) All of the above

34. A local population adapted genetically to its particular environment is termed as
    A) Ecesis B) Ecotype
    C) Edge effect D) None of these

35. In a family of seven children, what is the probability of there being 4 boys and 3 girls?
    A) 21/128 B) 7/128 C) 1/128 D) 35/128

36. Which of the following bond may be most difficult to break?
    A) C-O B) C-N C) C-C D) C-S

37. Which of the following statement(s) is/are correct regarding vitamin C?
    i. Also known as ascorbic acid
    ii. Is an antioxidant
    iii. Is a melanin synthesis retardant
    A) i only B) i and ii only
    C) i and iii only D) i, ii and iii

38. PCR based DNA amplification is an essential feature of which of the following combination of molecular marker?
    A) RFLP, AFLP and SSR
    B) AFLP, SSR and RAPD
    C) RFLP, RAPD and SSR
    D) RAPD, RFLP and SSR

39. Counter current mechanism of urine formation occurs in
    A) Bowman's capsule
    B) Proximate convoluted tubule
    C) Loop of Henle
    D) Distal convoluted tube

40. Two enzymes of TCA cycle catalyse reactions that result in the release of CO_2. They are
    A) Aconitase and malic dehydrogenase
    B) Fumarase and succinate dehydrogenase
    C) Isocitrate dehydrogenase and α-ketoglutarate dehydrogenase
    D) Malic dehydrogenase and succinyl co-A synthase

41. The sarcoplasmic reticulum must have integral membrane proteins that can
    A) Release and pump Ca^{2+}
    B) Bind to tropomyosin and troponin
    C) Undergo action potentials
    D) Contract

42. Upon shearing, some highly repetitive DNA sequences break into fragments that show a unique migration pattern on sedimentation in a CsCl density gradient. What are these fragments called?
    A) Alu sequence B) Nucleosomes
    C) Polysomes D) Satellite DNA

43. A bacterium divides in every 35 minutes. If a culture containing 10^5 cells/ml is grown for 175 minutes, what will be the cell concentration per ml after 175 minutes?
    A) 32×10^5 cells B) 35×10^5 cells
    C) 5×10^5 cells D) 175×10^5 cells

44. In which organelle is NADP+ the final electron acceptor?
    A) Chloroplast B) Mitochondria
    C) Chloroplast & mitochondria D) Lysosome

45. What happens to the Cdk-cyclinA complex at metaphase?
A) Both cyclin A and Cdk remain undegraded
B) Only Cdk is degraded
C) Only cyclin A is degraded
D) Both cyclin A and Cdk are degraded

46. The absence of sigma factor in RNA polymerase
A) Affects elongation only
B) Blocks initiation
C) Affect both initiation and elongation
D) Does not affect trasnscription

47. Which structural gene does Z represent in a lactase operon?
A) β-Galactosidase B) Permiase
C) Transacetylase D) Lactase

48. The law state that the force of heartbeat is determined primarily by the length of the fibres constituting its muscular wall, ie.,an increase in diastolic filling increases force of heart beat
A) Starling Law B) Gloger's law
C) Thorson's Law D) None of the above

49. Reflex action is comparatively more rapid because it has to pass through
A) Pituitary cortex B) All along spinal cord
C) Cerebral cortex D) Olfactory lobes

50. The prosthetic group of the light absorbing pigment bacterio rhodopsin
A) Retinal B) Ferredoxin
C) Quinone D) None of these

51. All of the following apply to the concept of the extinction vortex except:
A) Populations of the species entering it are small.
B) It is a concept developed by conservation biologists who adopt the "small population approach."
C) The genetic variation of the species' population decreases.
D) The key factor driving the extinction vortex is intraspecific competition.

52. If a person lives exclusively on a diet of milk, egg and bread, he is likely to suffer from
A) Rickets B) Beri-beri
C) Scurvy D) None of the above

53. Individuals with trisomy 13 is
A) Patau syndrome B) Edward syndrome
C) Down syndrome D) Jacob syndrome

54. Which of the following biome is known as Mediterranian scrub forest?
A) Chapparal B) Steppes
C) Tundra D) Savannah

55. Polysaccharides present in the exoskeleton of crab
A) Pectin B) Inulin
C) Dextrin D) Chitin

56. Failure of testes to descend into scrotum
A) Cryptorchidism B) Orchidectomy
C) Inguinal hernia D) Prostatectomy

57. The glycoprotein molecule of zonapellucida which binds to sperm in males?
A) ZP1 B) ZP2
C) ZP3 D) All of the above

58. When a person thinks and solves problems, which area of the cerebrum is involved?
A) Frontal lobe B) Parietal lobe
C) Occipital lobe D) Temporal lobe

59. The segment of myofibril that is called a sacromere runs from
A) One H zone to the next H zone
B) One Z line to the next Z line
C) One A band to the next A band
D) One end of a skeletal muscle to the opposite end

60. The secretion of which of these hormones would be increased in a person with endemic goiter?
A) TSH B) Thyroxine
C) Triiodothyromine D) All of these

61. Sea pen is a
A) Mollusc B) Echinoderm
C) Sponge D) Coelenterate

62. Scansorial adaptation is that found in terrestrial animals which:
A) Lives in burrows B) Fly in the air
C) Climb the walls, rocks etc D) Are fast runners

63. Ineucaryotes, the interaction of enhancer and promoter elements is brought closer by
A) Zinc finger B) DNA looping
C) Helix turn helix D) Palindrome

64. Both the Luria- Delbruck experiment and the Lederberg and Lederberg experiment demonstrate

A) Pre-selection mutation B) Post-selection mutation
C) Directed mutation D) Adaptive mutation

65. In which phase does segregation take place if recombination has not taken place?

A) Prophase I B) Anaphase I
C) Metaphase I D) Telophase I

66. Which of the following peptides has the most negative charge at PH 7.5?

A) A-A-G-A-P-C-V B) A-E-D-K-K-V-M
C) E-V-D-V-E-A-F D) Y-Y-K-N-R-H-G

67. COP II coated vesicles move materials from

A) ER to ERGIC and Golgi complex
B) ERGIC to ER and Golgi complex
C) TGN to endosomes and lysosomes
D) Trans Golgi cisternae to Cisgolgi cisternae

68. Genetic equilibrium is disturbed in natural populations by

A) Recurring mutation B) Random genetic drift
C) Migration D) All the above

69. Organs of urogenital system in mammals are derived from

A) Ectoderm B) Mesoderm C) Endoderm D) A and B

70. Which is the ring shaped sub unit of DNA polymerase holoenzyme that clamps replicating polymerase to DNA in eukaryotes?

A) PCNA B) FEN1 C) RFC D) RPA

71. What is the molarity of pure water at 25^0C?

A) 58.5M B) 55.5M C) 18M D) 36M

72. Arthropods differ from annelids in having the following

A) External segmentation marked
B) Ventral nerve cord with metamerically arranged ganglia and dorsal cerebral ganglia
C) Absence of cilia
D) Segmental arrangements of muscles

73. A protein is poorly produced in a diseased tissue. To determine whether the defect is at the level of transcription or translation, which of the following methods would you use?

A) Southern blotting B) Southern & northern blotting
C) Northern & western blotting D) Western blotting

74. The amount of energy entering a food chain depends on the
A) Direction of energy flow in the system
B) Efficiency of energy recycling in the system
C) Biomass of carnivores and their efficiency in locating and capturing animal prey
D) Biomass of autotrophs and their efficiency in transforming solar energy into chemical energy

75. Which of the cytokines listed below induces TH1 cells?
A) IL-7 B) IFN-γ
C) IL-4 D) IL-12

76. Which of the following is NOT a hypothesis explaining the advantages of group living?
A) Vigilance effect B) Dilution effect
C) Group foraging D) Parasite avoidance

77. The method used to localize a specific protein in intact cells
A) Western blotting B) Solid phase assay
C) Immunosorbant assay D) Immuno electron microscopy

78. If a species is a keystone predator, then its removal from a community should
A) Decrease population size of predator's preferred prey
B) Decrease species diversity in the prey community
C) Decrease productivity of the predator's preferred prey
D) Increase species diversity in the prey community

79. Acid rain damage depends on the buffering capacity of the soils in a given region. Damage has been greatest where the soil layer is
A) Thin and contains little Ca and Mg
B) Thin and contains abundant Ca and Mg
C) Thin and contains abundant Ca but little Mg
D) Thick and contains abundant Ca and Mg

80. Diethyl amino ethyl cellulose columns can be used to separate ----------
A) Positively charged proteins
B) Negatively charged proteins
C) Uncharged proteins
D) Low molecular weight proteins

81. When exposed to a cold environment for several weeks, many small mammals dramatically increase their capacity for heat production primarily by means of
A) Decreased insulation
B) Increased insulation
C) Shivering thermogenesis
D) Non shivering thermogenesis

82. Which of the following is the cleavage site of cyanogens bromide in a polypeptide?
A) Asparagin glycine bond
B) Carboxyl side of tryptophan residue
C) Carboxyl side of methionine residue
D) Carboxyl side of lysine and arginine residue

83. The glucagon hormone of pancreas is secreted by
A) Alpha cells B) Beta cells
C) Gamma cells D) Delta cells

84. Heparin, the anticoagulant present in blood, is secreted by
A) Plasma cells B) Mast cells
C) Macrophages D) Endothelial cells

85. Water retention in renal collecting duct is the function of
A) AQP 1 B) AQP 2
C) AQP 3 D) AQP 4

86. Which of the following blood vessel carries the digested food directly from stomach to liver?
A) Mesenteric artery B) Phrenic artery
C) Hepatic portal vein D) Renal portal vein

87. A vitamin used in the formation of red blood cells is
A) Vitamin B1 B) Vitamin B2
C) Vitamin B6 D) Vitamin B12

88. Which of the following is NOT a part of RNA processing in eukaryotes?
A) Splicing of exons B) Reverse transcription
C) Addition of 5'caps D) Addition of a poly A tail

89. Standard free energy of hydrolysis of ATP (to ADP)
A) -30.51 kJ/mol B) -7.3 kJ/mol
C) -43.2 kJ/mol D) -61.9 kJ/mol

90. A family tree construction using phylogenetic classification is called
A) Dendrogram B) Cladogram
C) Hologram D) Histogram

91. $CD4^+$ helper T cells bind to processed antigen when expressed in association with
A) Class I MHC molecule B) Class II MHC molecule
C) Both A and B D) IL-2 receptor

92. If a cell has no rigid cell wall, has no chloroplast or plastids, and the stored carbohydrate is glycogen, then the cell is from
A) Plant B) Fungus C) Bacteria D) Animals

93. The condition albinism in man is linked to the deficiency of the enzyme
A) Arginase
B) Thyrosinase
C) Glucose 6- phosphate dehydrogenase
D) Xanthine oxidase

94. A protein structure of eukaryotic chromosomes to which spindle fibres bind is?
A) Telomere B) Centromere
C) Kinetochore D) Centriole

95. Which of the following reproductive strategies is characteristic of marine invertebrates?
A) Long generation time, small clutch size
B) Short generation time, small clutch size
C) Long generation time, large clutch size
D) Short generation time, large clutch size

96. Human respiration follows
A) Boyle's law B) Beer's law
C) Allan's law D) Charles law

97. Which of the following animal phyla is diploblastic, that is, exhibits only two embryonic germ layers?
A) Rotifera B) Mollusca
C) Nematode D) Cnidaria

98. Insulin solution is known to form higher order aggrigates when exposed to higher temperatures. The presence of such aggregates could be resolved by
A) Native PAGE
B) SDS PAGE
C) Cation exchange chromatography
D) Anion exchange chromatography

99. MHC class I molecules are important for which of the following?
A) Binding of CD4 molecules on T cells
B) Binding of CD8 molecules on T cells
C) Presenting intact viral protein to T cells
D) Binding to Ig on B cells

100. Darwin finches in Galapagos island is an example of
A) Ecological equivalence B) Ecological Guild
C) Ecological dominance D) None of the above

101. α-amanitin inhibits
A) Only RNA polymerase I B) Only RNA polymerase II
C) Only RNA polymerase III D) All RNA polymerase

102. Which one of the following is the first event in eukaryotic translation process during the binding of the m-RNA leader sequences?
A) The binding of the m-RNA leader to the smaller ribosomal sub-unit
B) The binding of the m-RNA leader to the larger ribosomal sub-unit
C) The binding of the m-RNA leader to the polysomal core
D) The binding of the m-RNA leader to t-RNA

103. The anticoagulant found in uterine wall which prevents clotting of menstrual blood inside the uterus
A) Warfarin B) Heparin
C) Citrate salt D) Plasmin

104. Humans originated in the epoch known as
A) Pleistocene B) Eocene
C) Holocene D) Miocene

105. The structure of ideal Z-DNA has a
A) Mononucleotide repeat B) Dinucleotide repeat
C) Trinucleotide repeat D) Tetranucleotide repeat

106. The valency of iron in hemoglobin is
A) +1 B) +2
C) +3 D) +4

107. Association between sea anemone and hermit crab is
A) Symbiosis B) Parasitism
C) Commensalism D) None of the above

108. The counter current exchange in the vasa recta
A) Removes Na+ from the extra cellular fluid
B) Maintains high concentrations of NaCl in the extra cellular fluid
C) Raises the concentration of Na+ in the blood leaving the kidneys
D) Causes large quantities of Na+ to enter the filtrate

109. When adenylcyclase is activated
A) cAMP is formed B) cAMP is broken
C) G-protein binds to cAMP D) Steroid hormone enters the cells

110. Use of alkaline phosphate in cloning experiment is to
A) Remove phosphate group from insert DNA at 5'end
B) Remove phosphate group from insert DNA at 3'end
C) Remove phosphate group from vector DNA at 5'end
D) Remove phosphate group from vector DNA at3' end

111. Which of the following will be best to test for non coding viruses coding DNA?
A) Northern blotting B) Dot blot
C) Zoo blot D) All the above

112. Which of the following elements plays an important role in nitrogen fixation?
A) Mn B) Mo
C) Z D) Cu

113. Which of the following enzymes acts at the first step of gluconeogenesis?
A) Phosphoenolpyruvate carboxylase
B) Pyruvate carboxylase
C) Glucose 6- phosphatases
D) Phosphoglyceratemutase

114. Vitamin D is derived from which of the following precursors by the action of UV light?
A) Lanosterol B) 7-dehydrocholesterol
C) Glycocholate D) Squanlene epoxide

115. What is the phenotypic ratio in a monohybrid cross and dihybrid cross?
A) 1:2:1 & 1:1:1 B) 3:1 & 1:2:1
C) 3:1 & 9:3:3:1 D) 1:1 & 1:1:1

116. Which of the following acts as a hormone in vertebrates?
A) Oxygen B) Nitrous oxide
C) Carbon dioxide D) Ammonia

117. BLAST is an algorithm for comparing
A) Sequences B) Structures
C) Texts D) Both A and B

118. Lactose is converted to allolactose in an operon by
A) β-Galactosidase B) Permiase
C) Transacetylase D) Lactase

119. Which of the following is called a ribozyme?
A) 23s rRNA B) 40srRNA
C) 80s rRNA D) 60s rRNA

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