

ZOOLOGY

(Original Solved Question Paper)

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 *Ans. B*
2. Which RNA molecules inside cells can turn off the activity of specific genes?
A) RNAi B) dsRNA
C) microRNA D) RNAg *Ans. A*
3. How many micrograms of DNA are needed to make 100 μL of a 100 $\mu\text{g}/\text{ml}$ solutions?
A) 0.1 μg B) 1.0 μg
C) 10 μg D) 100 μg *Ans. C*
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 *Ans. D*
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 *Ans. B*
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 *Ans. A*
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) Flavin adenine dinucleotide B) Nitrate reductase
C) Sucro-phosphorase D) Inulase *Ans. B*
8. Burkitt's lymphoma is a type of cancer of
A) RBC B) WBC
C) Platelet D) Dentrite cells *Ans. B*
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 *Ans. B*

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 **Ans. B**
11. The following are some of the common diseases and their causes 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) **Ans. C**
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 phenotypically 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 **Ans. D**
13. An endocrine gland with ectodermal and mesodermal origin
A) Adrenal B) Epiphysis
C) Thyroid D) Parathyroid **Ans. A**
14. Growth due to the activity of reserve cells is
A) Multiplicative growth B) Auxetic growth
C) Accretionary growth D) Exponential growth **Ans. C**
15. Genetically dwarf plant is treated with gibberellic 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 **Ans. B**
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 **Ans. C**
17. Character which is not of Platyhelminthes
A) Triploblastic acoelomates
B) Unsegmented body
C) Flattened body with anterior-posterior ends and dorsal ventral sides
D) Alimentary canal with mouth and anus **Ans. D**

27. Michaelis constant (K_m) 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
Ans. C
28. A diet rich in protein leads to the formation of more
A) Salt and water
B) Minerals
C) Urea
D) Amino acids
Ans. A
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
Ans. B
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
Ans. A
31. DNA sequence is ATGCTTAG. What will be the sequence of m-RNA?
A) UACGAAUC
B) TUCGUUAC
C) CATAGCAT
D) UAGGUUTC
Ans. A
32. Lobmann's scheme of reactions are associated with
A) Neural transmission
B) Muscle contraction
C) Eye vision
D) None of these
Ans. B
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
Ans. D
34. A local population adapted genetically to its particular environment is termed as
A) Ecesis
B) Ecotype
C) Edge effect
D) None of these
Ans. B
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) $35/128$
Ans. D
36. Which of the following bond may be most difficult to break?
A) C-O
B) C-N
C) C-C
D) C-S
Ans. A

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 **Ans. D**
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 **Ans. B**
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 **Ans. C**
40. Two enzymes of TCA cycle catalyse reactions that result in the release of CO₂. 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 **Ans. C**
41. The sarcoplasmic reticulum must have integral membrane proteins that can
A) Release and pump Ca²⁺
B) Bind to tropomyosin and troponin
C) Undergo action potentials
D) Contract **Ans. A**
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 **Ans. D**
43. A bacterium divides in every 35 minutes. If a culture containing 10⁵ cells/ml is grown for 175 minutes, what will be the cell concentration per ml after 175 minutes?
A) 32×10⁵ cells
B) 35×10⁵ cells
C) 5×10⁵ cells
D) 175×10⁵ cells **Ans. A**
44. In which organelle is NADP⁺ the final electron acceptor?
A) Chloroplast
B) Mitochondria
C) Chloroplast & mitochondria
D) Lysosome **Ans. C**

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 *Ans. C*
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 transcription *Ans. C*
47. Which structural gene does Z represent in a lactase operon?
A) β -Galactosidase
B) Permiase
C) Transacetylase
D) Lactase *Ans. A*
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 *Ans.D*
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 *Ans. B*
50. The prosthetic group of the light absorbing pigment bacterio rhodopsin
A) Retinal
B) Ferredoxin
C) Quinone
D) None of these *Ans. A*
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. *Ans. D*
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 *Ans.C*
53. Individuals with trisomy 13 is
A) Patau syndrome
B) Edward syndrome
C) Down syndrome
D) Jacob syndrome *Ans. A*

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
Ans. A
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
Ans. B
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
Ans. C
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
Ans. A
68. Genetic equilibrium is disturbed in natural populations by
A) Recurring mutation B) Random genetic drift
C) Migration D) All the above
Ans. D
69. Organs of urogenital system in mammals are derived from
A) Ectoderm B) Mesoderm C) Endoderm D) A and B
Ans. 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
Ans. A
71. What is the molarity of pure water at 25⁰C?
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 metamericly arranged ganglia and dorsal cerebral ganglia
C) Absence of cilia
D) Segmental arrangements of muscles
Ans. B
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
Ans. C

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

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 *Ans. C*
83. The glucagon hormone of pancreas is secreted by
A) Alpha cells
B) Beta cells
C) Gamma cells
D) Delta cells *Ans. A*
84. Heparin, the anticoagulant present in blood, is secreted by
A) Plasma cells
B) Mast cells
C) Macrophages
D) Endothelial cells *Ans. B*
85. Water retention in renal collecting duct is the function of
A) AQP 1
B) AQP 2
C) AQP 3
D) AQP 4 *Ans. C*
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 *Ans. C*
87. A vitamin used in the formation of red blood cells is
A) Vitamin B1
B) Vitamin B2
C) Vitamin B6
D) Vitamin B12 *Ans. D*
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 *Ans. B*
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 *Ans. A*
90. A family tree construction using phylogenetic classification is called
A) Dendrogram
B) Cladogram
C) Hologram
D) Histogram *Ans. B*
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 *Ans. B*
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 *Ans. D*

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 *Ans. B*
94. A protein structure of eukaryotic chromosomes to which spindle fibres bind is?
A) Telomere
B) Centromere
C) Kinetochore
D) Centriole *Ans. C*
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 *Ans. D*
96. Human respiration follows
A) Boyle's law
B) Beer's law
C) Allan's law
D) Charles law *Ans. A*
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 *Ans. D*
98. Insulin solution is known to form higher order aggregates 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 *Ans. A*
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 *Ans. B*
100. Darwin finches in Galapagos island is an example of
A) Ecological equivalence
B) Ecological Guild
C) Ecological dominance
D) None of the above *Ans. B*
101. α -amanitin inhibits
A) Only RNA polymerase I
B) Only RNA polymerase II
C) Only RNA polymerase III
D) All RNA polymerase *Ans. B*

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 *Ans. A*
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 *Ans. D*
104. Humans originated in the epoch known as
A) Pleistocene
B) Eocene
C) Holocene
D) Miocene *Ans. A*
105. The structure of ideal Z-DNA has a
A) Mononucleotide repeat
B) Dinucleotide repeat
C) Trinucleotide repeat
D) Tetranucleotide repeat *Ans. B*
106. The valency of iron in hemoglobin is
A) +1
B) +2
C) +3
D) +4 *Ans. B*
107. Association between sea anemone and hermit crab is
A) Symbiosis
B) Parasitism
C) Commensalism
D) None of the above *Ans. C*
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 *Ans. B*
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 *Ans. A*
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 at 3' end *Ans. C*
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 *Ans. C*

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