

## ZOOLOGY

(Original Solved Question Paper)

**15635****120 MINUTES**

1. The origin of heart beats and their conduction is represented in the pathway
  - A) AVN - Bundle of His – SAN - Network of Purkinje fibers
  - B) Network of Purkinje fibers – AVN – SAN - Bundle of His
  - C) AVN – SAN - Bundle of His - Network of Purkinje fibers
  - D) SAN - AVN - Bundle of His - Network of Purkinje fibers

*Ans. (D)*
  
2. Puffs of salivary gland chromosomes are the site for
  - A) Protein synthesis
  - B) DNA synthesis
  - C) RNA synthesis
  - D) Replication of DNA

*Ans. C*
  
3. Two examples of substrate level phosphorylation in EM pathway of glucose metabolism are in the reactions of
  - A) 1,3 bisphosphoglycerate and phosphoenol pyruvate
  - B) Glucose-6 phosphate and Fructo-6-phosphate
  - C) 3 phosphoglyceraldehyde and phosphoenolpyruvate
  - D) 1, 3 diphosphoglycerate and 2-phosphoglycerate

*Ans. A*
  
4. A woman who married her first cousin wants to know the risk of having a child with cystic fibrosis because her grandmother, who is also her husband's grandmother, died of cystic fibrosis. The chances of her risk is
  - A)  $1/8$
  - B)  $1/16$
  - C)  $1/60$
  - D)  $1/120$

*Ans. B*
  
5. The type of placenta in primates is
  - A) Diffuse
  - B) Zonary
  - C) Cotyledonary
  - D) Discoid

*Ans. D*
  
6. Which of the following transcription factors play a major role in inflammatory signaling in cells of the vertebrate immune system?
  - A) STAT
  - B) NF-kappa B
  - C) CREB
  - D) SP-1

*Ans. B*
  
7. Phospholipid with choline as nitrogen group is called
  - A) Cutin
  - B) Lecithin
  - C) Lignin
  - D) Suberin

*Ans. B*
  
8. Which of the following layer is the outermost one of the skin with dead cells?
  - A) Stratum lucidum
  - B) Stratum corneum
  - C) Stratum spinosum
  - D) Stratum granulosum

*Ans. B*
  
9. If a normal woman marries a colourblind man
  - A) All their children will be colourblind
  - B) All their sons will be colorblind but the daughters will be normal
  - C) All the children will be normal
  - D) All daughters will be colourblind and sons will be normal

*Ans. C*



21. FAD participated as the hydrogen acceptor in Krebs cycle during the conversion of  
A) Succinyl co-A to succinic acid  
B) Fumaric acid to malic acid  
C) Succinic acid to fumaric acid  
D) Iso-citric acid to oxalosuccinic acid *Ans. C*
22. Which GTPase regulates intracellular transport in mammalian cell through  
A) Rab                      B) Ran                      C) Ras                      D) Rho *Ans. A*
23. Growth due to the activity of reserve cells is  
A) Accretionary growth                      B) Multiplicative growth  
C) Auxentic growth                      D) Exponential growth *Ans. A*
24. In which microscopic technique use out-of-phase light waves to produce differences in contrast are combined with two beams of light travelling close together, which create even more contrast, especially at the edge of the structures  
A) Bright field microscopy  
B) Dark field microscopy  
C) Phase contrast microscopy  
D) Differential interference contrast microscopy *Ans. D*
25. Nerve cells of retina are  
A) Bipolar                      B) Multipolar  
C) Unipolar                      D) Apolar *Ans. A*
26. The latest and most effective therapy for AIDS patients includes azidothymidine (AZT), dideoxyinosine (DDI), and saquinavir or similar agents. Use of these three drugs would inhibit which of the following viral processes?  
A) RNase, DNase  
B) gp 120 formation  
C) p 24 antibody expression  
D) Reverse transcriptase, protease *Ans. A*
27. In melandrium the sex determination type is  
A) XX – XY type                      B) XX – XO type  
C) ZZ – ZW type                      D) XY – XO type *Ans. D*
28. Number of mitotic divisions required to produce 128 cells from a single cell is  
A) 7                      B) 14                      C) 8                      D) 16 *Ans. A*
29. 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) Silicosis                      B) Emphysema  
C) Anosmia                      D) Bronchitis *Ans. A*

30. The assemblage of all the populations of different species that function as an integrative unit  
A) Population B) Species  
C) Biome D) Biotic community *Ans. B*
31. Mark the hormone, not produced, but released through pars nervosa  
A) ACTH B) LH  
C) ADH D) LTH *Ans. C*
32. Ampulle of Lorenzini are the thermoreceptors found in  
A) Fishes B) Amphibians  
C) Reptiles D) Birds *Ans. A*
33. A living organism is considered to be in a steady state, it means  
A) The rate of input of matter and energy exceeds that of output  
B) The rate of input of energy and matter equals that of output  
C) The rate of output of energy is greater than that of input  
D) The rate of input of energy is greater than that of output *Ans. B*
34. The small part of chromosome arm beyond secondary constriction is called  
A) Kinetochore B) Satellite  
C) Centromere D) Telomere *Ans. B*
35. Gram-negative and gram-positive bacteria possess which one of the following structures?  
A) Peptidoglycan B) Matrix protein  
C) Pili D) Flagella *Ans. A*
36. Human respiration follows  
A) Boyle's law B) Beer's law  
C) Allan's law D) Charles law *Ans. A*
37. Duchene muscular dystrophy is caused by the presence of:  
A) A defective gene in X-chromosome  
B) An extra 18th chromosome  
C) Two X-chromosomes and one Y-chromosome in an individual  
D) An extra 21st chromosome *Ans. A*
38. These are specialized fat body cells which store Potassium-urate and uric acid as excretory waste  
A) Calloblast cells B) Trichogen cells  
C) Peptic cells D) Urate cells *Ans. D*
39. T/t genes control the character 'height'. In a population of 500 individuals there are 400 T allele. How many 't' allele will be present in that population?  
A) 600 B) 1000 C) 400 D) 1200 *Ans. A*
40. Tendons connect  
A) Bone to bone B) Bone to muscle  
C) Muscle to muscle D) Muscle to nerve *Ans. B*

41. If the insulin gene located on Chromosome II is switched on all the time, the blood sugar in the blood and other organs will be devastated within a short time, so gene expression is regulated by on-off switches and such genes are called  
A) Constitutive genes                      B) Housekeeping genes  
C) Inducible genes                          D) Selfish genes Ans. C
42. Among the following which is not an assumption of Hardy-Weinberg rule?  
A) No natural selection  
B) Random mating  
C) Small population size Ans. C  
D) No mutation
43. The substitution of valine for glutamate at position 6 on the two  $\beta$  chains in sickle cell hemoglobin causes which of the following?  
A) Increased electrophoretic mobility at pH 7.0  
B) Increased solubility of deoxyhemoglobin  
C) Decreased polymerization of deoxyhemoglobin  
D) Unchanged primary structure Ans. A
44. All of the following are true of antigen EXCEPT  
A) They contain epitopes                      B) They contain antigenic determinants  
C) They contain paratopes                      D) They can elicit immune response Ans. C
45. Holandric genes are present in  
A) Autosomes                                      B) X chromosomes  
C) Y chromosomes                                D) None of the above Ans. C
46. Analysis of a patient's stool reveals small structures resembling rice grains; microscopic examination shows these to be proglottids. The most likely organism in this patient's stool is  
A) *Enterobius vermicularis*                      B) *Ascaris lumbricoides*  
C) *Necator americanus*                          D) *Taenia saginata* Ans. D
47. How many bacteria are produced in four hours if a bacterium divides once in half an hour?  
A) 8    B) 64    C) 128    D) 256 Ans. D
48. If a dwarf pea plant was treated with giberellic acid, it grew tall as a pure tall plant. If it is crossed with a pure tall plant, then the phenotype ratio of F1 progeny will be  
A) All dwarf    B) 50% tall and 50% dwarf  
C) 75% tall and 25% dwarf                      D) All tall Ans. D
49. A geographically localized group of individuals of the same kind at a particular time represents a  
A) Tribe    B) Species  
C) Community    D) Population Ans. D



60. Eggs of Branchiostoma come under which classification of egg based on the amount of yolk?  
A) Microlecithal egg                      B) Mesolecithal egg  
C) Megalecithal egg                      D) None of the above                      **Ans. A**
61. Which of the following is first digested in the stomach?  
A) Carbohydrate                      B) Fat  
C) Protein                      D) Nucleic acid                      **Ans. C**
62. Fragile X-associated mental retardation syndrome  
A) Is transmitted from father to son  
B) Affects females and males equally  
C) 20% of carrier males show no sign of the syndrome  
D) Involves a nonrepetitive segment of DNA                      **Ans.C**
63. Which of the following is common to blood plasma and serum?  
A) Plasma protein                      B) Water  
C) Calcium ions                      D) Fibrinogen and platelets                      **Ans. B**
64. When two or more subliminal stimulus are given to a muscle fibre in quick succession the muscle fibre contracts. The phenomenon is  
A) Tetanus                      B) Summation  
C) Tonus                      D) Tension                      **Ans. B**
65. Which aspect of mitosis is affected by colchicine in inducing polyploidy?  
A) DNA duplication                      B) Chromosome doubling  
C) Spindle formation                      D) Formation of cell plate                      **Ans. C**
66. Geraniol is secreted from  
A) Queen honey bee                      B) Worker bee  
C) Termite                      D) Male honey bee                      **Ans. B**
67. Polytene chromosomes in salivary glands of Drosophila are formed as a result of  
i Endoduplication  
ii Duplication without separation  
iii Replication of DNA without cell division  
A) i & ii only                      B) i & iii only  
C) ii & iii only                      D) i, ii & iii                      **Ans. D**
68. 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**
69. The principal site of peptide neurohormone biosynthesis is  
A) Nucleus                      B) Rough ER  
C) Dendrite                      D) Post synaptic density                      **Ans. B**





78. VNTR analysis involves:  
A) Analyzing specific loci for 2 base repeating units usually less than 100 bp in size  
B) Analyzing specific loci for 2 to 4 bp repeating units  
C) PCR amplification of specific genes  
D) Cutting DNA with restriction enzyme and analyzing the banding pattern of fragments *Ans. D*
79. At high altitude, the RBC in human blood will  
A) Increase in size                      B) Decrease in size  
C) Increase in number                  D) Decrease in number *Ans. C*
80. The signal transduction pathway in rod cells by light does not involve which of the following enzymes?  
A) cGMP                                      B) cGMP phosphodiesterase *Ans. D*  
C) Guanylyl cyclase                      D) Adenylate cyclase
81. Frame shift mutations occur following  
A) Tautomeric shift                      B) Base substitution  
C) Dimer formation                      D) Deletion of single base *Ans. D*
82. Immunity theory of ageing depends mainly on  
A) Thymus                                      B) Thyroid *Ans. A*  
C) Pituitary                                      D) Adrenal
83. Charged tRNA refers to  
A) Aminoacyl tRNA                      B) Hypomethyl tRNA  
C) Pseudouridyl tRNA                      D) Hyperuridyl tRNA *Ans. A*
84. The number of substrate molecules acted upon by a molecule of enzyme is  
A) Induction number                      B) Activation number  
C) Turn over number                      D) Modulation number *Ans. C*
85. A 15-year-old girl with short stature, neck webbing, and sexual infantilism is found to have coarctation of the aorta. A chromosomal analysis would demonstrate  
A) Mutation at chromosome 15q 21.1  
B) Trisomy 21  
C) XO karyotype *Ans. C*  
D) Defect at chromosome 4p16
86. It is well known that DNA polymerases synthesize DNA only in the 5' to 3' direction. Yet, at the replication fork, both strands of parental DNA are being replicated with the synthesis of new DNA. How is it possible that while one strand is being synthesized in the 5' to 3' direction, the other strand appears to be synthesized in the 3' to 5' direction? This apparent paradox is explained by  
A) 3' to 5' DNA repair enzymes  
B) 3' to 5' DNA polymerase  
C) Okazaki fragments  
D) Replication and immediate crossover of the leading strand *Ans. C*

87. HLA (Human leucocyte antigen) is located on  
A) Chromosome number 22      B) Chromosome number 18  
C) Chromosome number 12      D) Chromosome number 6 *Ans. D*
88. Memory region is located in which region of human brain  
A) Temporal lobe                      B) Frontal lobe  
C) Parietal lobe                      D) Occipital lobe *Ans. A*
89. A mixture of heat killed NL – cells (dead cells) and live L- cells is injected into mice. NL- type cells are pathogenic, develop a disease and kill the animals. On the other hand L – type cells are non pathogenic. The expected results could be  
A) Mice develop disease and die  
B) Mice die without developing disease  
C) Mice do not develop disease and also do not die  
D) All mice remain healthy but lose vision *Ans. A*
90. Allosteric inhibition  
A) Makes active site unfit for substrate  
B) Control excess formation of end product  
C) Both A and B  
D) None of the above *Ans. C*
91. 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*
92. Which of the following techniques would be the best choice for screening a person's genetic profile for 1,000 or more genes?  
A) Microarray analysis      B) VNTR analysis  
C) FISH      D) RFLP analysis *Ans. A*
93. Percentage of frequency phenotypic effect of genes is called  
A) Phenocopy                      B) Polyphony  
C) Polytypy                      D) Penetrance *Ans. D*
94. Wharton's duct is associated with  
A) Parotid gland                      B) Sub maxillary gland  
C) Sublingual gland                      D) Gastric gland *Ans. B*
95. Chaga's disease affecting blood circulation is a  
A) Viral disease                      B) Protozoan disease  
C) Fungal disease                      D) Helminth disease *Ans. B*
96. A pentose sugar present in the heart muscle is  
A) Xylose                      B) Xylulose  
C) Lyxose                      D) Aldose *Ans. C*

97. When a B-cell undergoes immunoglobulin class switching
- A) the variable region of the light chain changes, but its constant region remains the same
  - B) the variable region of the light chain remains the same, but its constant region changes
  - C) the variable region of the heavy chain remains the same but its constant region changes
  - D) the variable region of the heavy chain changes but its constant region remains the same
- Ans. C*
98. The genesis of Prader-Willi syndrome by inheritance of two normal chromosomes from a single parent is an example of
- A) Germinal mosaicism
  - B) Genomic imprinting
  - C) Chromosome deletion
  - D) Chromosome rearrangement
- Ans. B*
99. The anticoagulant found in the blood vessels which prevent clotting of menstrual blood inside the uterus
- A) Heparin
  - B) Hirudin
  - C) Plasmin
  - D) EDTA
- Ans. C*
100. Which of the following is/are true about GFP?
- A) GFP is a bioluminescent marker
  - B) A herterologus marker used in Caenorhabditis elegans
  - C) Isolated from the jelly fish Aequoria Victoria
  - D) All of the above
- Ans. D*
101.  $\alpha$ -amanitin inhibits
- A) Only RNA polymerase I
  - B) Only RNA polymerase II
  - C) Only RNA polymerase III
  - D) All RNA polymerase
- Ans. B*
102. Ultraviolet light can damage a DNA strand causing
- A) Two adjacent purine residue to form a covalently bonded dimer
  - B) Two adjacent pyrimidine residues to form covalently bonded dimer
  - C) Disruption of phosphodiesterase linkage
  - D) Disruption of non-covalent linkage
- Ans. B*
103. Bidder's canal
- A) runs from gall bladder to duodenum, through which bile flows in vertebrates
  - B) connects testis to kidney and conducts sperm in frog
  - C) carry milk from mammary glands to the tip of the nipple in placentals
  - D) canal between external ovary and internal ovary
- Ans. B*
104. Erythromycin is the antibiotic of choice when treating respiratory tract infections in legionnaire' s disease, whooping cough, and Mycoplasma-based pneumonia because of its ability to inhibit protein synthesis in certain bacteria by
- A) Inhibiting translocation by binding to 50S ribosomal subunits
  - B) Acting as an analogue of mRNA
  - C) Causing premature chain termination
  - D) Inhibiting initiation
- Ans. A*

105. Knee jerk reaction is an example of what type of reflex?  
A) Monosynaptic                      B) Multisynaptic  
C) Conditioned                         D) Conscious                             *Ans. A*
106. Which of the following method can be used to study protein-protein interaction?  
A) Co-immunoprecipitation        B) Peptide mapping  
C) Radiolabeling                      D) Enzyme linked immunoassay     *Ans. A*
107. A significant deficiency in vitamin D in adults might be expected to lead to  
A) Osteomalacia  
B) Rickets  
C) Hyperostosis  
D) Increased absorption of Calcium     *Ans. A*
108. Which of the following vitamins can act without phosphorylation?  
A) Pyridoxine                          B) Lipoamide  
C) Thiamine                             D) Riboflavin                             *Ans. B*
109. What happens to pyruvate, the product of glycolysis?  
A) In the presence of oxygen, pyruvate is oxidized to acetyl-Co-A, which enters the Krebs cycle  
B) In the absence of oxygen, pyruvate is reduced and carried by NADH  
C) When pyruvate is reduced directly, the product is lactate  
D) All of the above                             *Ans. D*
110. Fats are efficient energy-storage molecules because of their  
A) High concentration of C-H bond  
B) Low concentration of C-H bond  
C) High concentration of O-H bond  
D) Low concentration of O-H bond                             *Ans. A*
111. Women become susceptible to osteoporosis after menopause due to decreased  
A) Secretion of Parathormone  
B) Conversion of vitamin D into calcitriol  
C) Secretion of estrogen  
D) Secretion of progesterone                             *Ans. C*
112. Which statement is correct for r- selected species?  
A) Large number of progeny with large size  
B) Small number of progeny with large size  
C) Large number of progeny with small size  
D) Small number of progeny with small size                             *Ans. C*
113. Number of linkage group in an organism is always equal to  
A) Number of X chromosome  
B) Number of Y chromosome  
C) Number of barr bodies  
D) Haploid number of chromosomes                             *Ans. D*

114. Shine – Dalgarno sequence is associated with  
A) Translation                      B) Transcription  
C) Replication                      D) Recombination                      *Ans. A*
115. Fire resistant resinous plants are not a characteristic of  
A) Chapparal                      B) Deciduous forest  
C) Tropical savannah                      D) Tundra                      *Ans. D*
116. In the cell cycle, DNA synthesis takes place during  
A) G1- Phase    B) G2- Phase    C) S- Phase    D) Both A&B                      *Ans. C*
117. Endostyle is present in  
A) Amphioxus                      B) Shark  
C) Salamander                      D) Turtle                      *Ans. A*
118. Clostridium botulinum is an example of  
A) Obligate anaerobes                      B) Obligate aerobes  
C) Facultative anaerobes                      D) Facultative aerobes                      *Ans. A*
119. Polar bear is larger in size than black bear, this is explained by  
A) Allen's rule                      B) Jordan's rule  
C) Gloger's rule                      D) Bergman's rule                      *Ans. D*
120. In a marriage made between a universal donor mother and a universal recipient father, what will be the possible % of blood group of children?  
A) 50% A and 50% B                      B) 100% AB  
C) 100% O                      D) 50% AB and 50% O                      *Ans. A*
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