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Hall Ticket Number

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Q.B. No.

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Booklet Code :

A

Marks : 100

Time : 120 minutes

JL-418-Zoo

A

Signature of the Candidate

Signature of the Invigilator

Total No. of Questions : 100}

[Total No. of Printed Pages : 24

INSTRUCTIONS TO THE CANDIDATE

(Read the Instructions carefully before Answering)

1. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with Question Paper Booklet. Please read and follow the instructions on the OMR Answer Sheet for marking the responses and the required data.
2. The candidate should ensure that the **Booklet Code printed on OMR Answer Sheet and Booklet Code supplied are same.**
3. **Immediately on opening the Question Paper Booklet by tearing off the paper seal, please check for (i) The same booklet code (A/B/C/D) on each page, (ii) Serial Number of the questions (1-100), (iii) The number of pages and (iv) Correct Printing.** In case of any defect, please report to the invigilator and ask for replacement of booklet with same code within five minutes from the commencement of the test.
4. Electronic gadgets like Cell Phone, Calculator, Watches and Mathematical/Log Tables are not permitted into the examination hall.
5. **There will be 1/4 negative mark for every wrong answer.** However, if the response to the question is left blank without answering, there will be no penalty of negative mark for that question.
6. Record your answer on the OMR answer sheet by using Blue/Black ball point pen to darken the appropriate circles of (1), (2), (3) or (4) corresponding to the concerned question number in the OMR answer sheet. *Darkening of more than one circle against any question automatically gets invalidated and will be treated as wrong answer.*
7. Change of an answer is **NOT** allowed.
8. Rough work should be done only in the space provided in the Question Paper Booklet.
9. **Return the OMR Answer Sheet and Question Paper Booklet to the invigilator before leaving the examination hall.** Failure to return the OMR sheet and Question Paper Booklet is liable for criminal action.

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1. Chromosomes measurements are generally taken during -
 - (1) Interphase
 - (2) Prophase
 - (3) Anaphase
 - (4) Metaphase

2. Two crosses between the same type of genotypes or phenotypes in which the sources of the gametes is reversed in one cross is known as -
 - (1) Test cross
 - (2) Reciprocal cross
 - (3) Dihybrid cross
 - (4) Back cross

3. Discovery of ABO blood groups was carried out by -
 - (1) Charles Darwin
 - (2) Karl Landsteiner
 - (3) Gregor Mendel
 - (4) Watson

4. Which of the following is a common feature present in prokaryotic and eukaryotic cells?
 - (1) Cell wall made of cellulose.
 - (2) Golgi complex.
 - (3) Linear chromosomes.
 - (4) Ribosomes.

5. Movement of molecules in a cell against concentration gradient is called
 - (1) Osmosis
 - (2) Active transport
 - (3) Passive transport
 - (4) Diffusion



6. The orders of insect, where the adults have cutting and chewing type of mouthparts
- (1) Lepidoptera
 - (2) Diptera
 - (3) Coleoptera
 - (4) Hemiptera
7. Gene A and B are linked genes. Which of the following gametes show recombination?
- (1) AB
 - (2) ab
 - (3) Ab
 - (4) BB
8. The major excretory product of frog urine is
- (1) Ammonia
 - (2) Urea
 - (3) Uric acid
 - (4) Amino acid
9. On an average, the daily volume of urine produced by adults of human is
- (1) 200-300 ml
 - (2) 300-500 ml
 - (3) 800-1500 ml
 - (4) 2000-3000 ml
10. Lamarck theory of Organic Evolution is known as
- (1) Natural selection.
 - (2) Inheritance of acquired characters.
 - (3) Descent with change.
 - (4) Chain of life.



11. A common disorder usually caused by an error in cell division called "nondisjunction" where severely affected people have an extra full or partial copy of chromosome 21 is called as
- (1) Duchene Muscular dystrophy.
 - (2) Down's syndrome
 - (3) Fragile X syndrome
 - (4) Retinoblastoma
12. A point mutation in which a codon specifying an amino acid is altered into stop codon is called as
- (1) Missense mutation.
 - (2) Nonsense mutation.
 - (3) Frame shift mutation.
 - (4) Deletion mutation.
13. Sickle cell anemia condition confers protection against one of the following diseases :
- (1) Trypanosomiasis
 - (2) Leishmaniasis
 - (3) Malaria
 - (4) Toxoplasmosis
14. A process in which the recessive alleles become homozygous, express themselves and then they are eliminated by selection is commonly known as -
- (1) Inbreeding
 - (2) Segregation
 - (3) Horizontal transfer
 - (4) Spontaneous mutation



15. Amniotic membrane during mammalian embryonic development is derived from -
- (1) ectoderm and mesoderm.
 - (2) ectoderm and endoderm.
 - (3) endoderm and mesoderm.
 - (4) ectoderm and trophoblast.
16. The diagrammatic representation of karyotype of a species is called -
- (1) histogram
 - (2) ideogram
 - (3) chromogram
 - (4) cladogram
17. Monosaccharide which is **not** a carboxylic acid-
- (1) Glucose
 - (2) Gluconate
 - (3) Glucuronate
 - (4) Muramic acid
18. Precursor T-lymphocytes develop into fully competent but not fully activated T-cells in -
- (1) thymus gland
 - (2) lymph nodes
 - (3) bone marrow
 - (4) spleen
19. Hans Adolf Krebs was awarded Nobel Prize in Physiology and Medicine for his discovery in :
- (1) Cellular signal transduction.
 - (2) Citric acid cycle.
 - (3) Cell cycle.
 - (4) Co-enzyme A.



20. Micronemes are the organelles for storage of secretory proteins in one of the following protozoan parasites -
- (1) *Euglena*
 - (2) *Trypanosoma*
 - (3) *Paramecium*
 - (4) *Plasmodium*
21. Marine annelids belong to class -
- (1) Chaetopoda
 - (2) Oligochaeta
 - (3) Hirudinea
 - (4) Polycheta
22. Which of the following is photosensitive part of insect Ommatidium?
- (1) Crystalline cone
 - (2) Pigment cells
 - (3) Rhabdome
 - (4) Sensory neuron
23. The unfertilized eggs laid by queen bee develop into -
- (1) Queens
 - (2) female workers
 - (3) drones
 - (4) hermaphrodites
24. Which of the following statement is **not correct** about mammalian chromosome number? It is constant -
- (1) within individuals in a species in an ecosystem.
 - (2) within different species in an ecosystem.
 - (3) within different somatic cells of an organism.
 - (4) between male and female individuals in a species.



25. A cow genetically developed to express a foreign protein of therapeutic importance in milk is called as -
- (1) Chimeric
 - (2) Congenic
 - (3) Hybrid
 - (4) Transgenic
26. The members of which molluscan class undergo embryonic torsion?
- (1) Chitons
 - (2) Gastropods
 - (3) Cephalopods
 - (4) Bivalves
27. Which of the following cell type secretes histamine?
- (1) T lymphocytes
 - (2) Mast cells
 - (3) Macrophage
 - (4) Eosinophil
28. For excretion, annelids use -
- (1) Flame cells
 - (2) Nephridia
 - (3) Uriniferous tubules.
 - (4) Malpighian tubules.
29. The compartments present in the stomach of ruminants are-
- (1) Esophagus, omasum, abomasum, rumen.
 - (2) Omasum, abomasum, rumen, duodenum.
 - (3) Reticulum, abomasum, rumen, duodenum.
 - (4) Reticulum, omasum, abomasum, rumen.



30. Which of the following is commonly known as hookworm?
- (1) *Ancylostoma*
 - (2) *Ascaris*
 - (3) *Trichinella*
 - (4) *Fasciola*
31. Cytochromes are found in -
- (1) Inner mitochondrial membrane.
 - (2) Cristae of mitochondria.
 - (3) Matrix of mitochondria.
 - (4) Outer mitochondrial membrane.
32. In human, albinism is caused by recessive gene 'a'. A child has albinism, although none of the parents are affected. What is the genotype of parents?
- (1) AA and AA.
 - (2) Aa and AA.
 - (3) Aa and Aa.
 - (4) Aa and aa.
33. The only class of antibodies, which can cross the placental barrier -
- (1) IgA
 - (2) IgD
 - (3) IgE
 - (4) IgG
34. Which of the following is mis-matched?
- (1) Matrix- extracellular material in connective tissue.
 - (2) Cardiac muscle cells-multiple nuclei.
 - (3) Adipose cells- found in loose connective tissue.
 - (4) Ligaments-bind muscles to bone.



35. Which of the following description of chromosomes is **not** correctly matched?
- (1) Metacentric - chromosome arms are almost equal in size.
 - (2) Submetacentric - chromosome arms are slightly different in size.
 - (3) Acrocentric - chromosome arms are identical in size.
 - (4) Telocentric - there is only one chromosome arm.
36. Specificity of antigen binding to an antibody molecule is determined by-
- (1) Hypervariable regions.
 - (2) Variable regions.
 - (3) Fab regions.
 - (4) Heavy and light chain regions.
37. Small chemical groups in the antigen molecule which effectively react with antibody are called -
- (1) Paratope
 - (2) Epitope
 - (3) Isotope
 - (4) Allotope
38. Kupffer cells are macrophages found in -
- (1) lung
 - (2) liver
 - (3) kidney
 - (4) bone
39. Which of the second messengers listed below remains bound to the plasma membrane?
- (1) Diacylglycerol
 - (2) cGMP
 - (3) IP₃
 - (4) cAMP



40. The physical barriers that form part of the immune system are-
- (1) The bones and mucosal membrane.
 - (2) The skin and the mucosal membrane.
 - (3) The liver and mucosal membrane.
 - (4) Body temperature and mucosal membrane.
41. Organelle that break down long chain fatty acids through beta oxidation-
- (1) Phagosomes
 - (2) Peroxisomes
 - (3) Endosomes
 - (4) Lysosomes
42. Which one of the following is **not** a common aqua-culture product of India?
- (1) Tuna fish
 - (2) Tilapia
 - (3) *Catla catla*
 - (4) *Labeo rohita*
43. In which of the following, induced breeding technique is commonly used for scaling up the farm production?
- (1) Marine fishery
 - (2) Inland fishery
 - (3) Capture fishery
 - (4) Culture fishery
44. Which of the following is correct group of reptilia?
- (1) Frogs, turtles, lizards and snakes.
 - (2) Frogs, salamanders, lizards and snakes.
 - (3) Frogs, turtles, lizards and crocodilians.
 - (4) Turtles, lizards snakes and crocodilians.



45. Neoteny is found in the larvae of -
- (1) *Rana*
 - (2) *Salamandra*
 - (3) *Ichthyophis*
 - (4) *Necturus*
46. A group of naturally or potentially interbreeding population that are reproductively isolated from other such groups is a definition of -
- (1) a pre-zygotic isolating mechanism.
 - (2) a ring species.
 - (3) the biological species concept.
 - (4) the principle of parsimony.
47. Which of the following statements regarding male gamete formation is **not true**?
- (1) Spermatids are formed from spermatocytes following the completion of the second meiotic division.
 - (2) During spermatogenesis the spermatids divide by mitosis but remain linked by cytoplasmic bridges.
 - (3) Spermatids develop into sperm by the process of spermiogenesis.
 - (4) The nucleus of each spermatid contains 23 autosomes.
48. In which of the following mammal, monophodont teeth are found?
- (1) Human
 - (2) Whale
 - (3) Rat
 - (4) Mouse
49. Which one of the following is a non-poisonous snake?
- (1) Python
 - (2) Cobra
 - (3) Dryophis
 - (4) Elapes



50. Which of the following is filled with clear, thick, gel like substance and is the main chamber of eye?
- (1) Anterior chamber.
 - (2) Posterior chamber.
 - (3) Vitreous chamber.
 - (4) Aquous chamber.
51. Receptors for the following hormones are found in the cytoplasm of responsive cells -
- (1) Thyroid hormone and Insulin.
 - (2) Glucagon and estrogen.
 - (3) Insulin and estrogen.
 - (4) Thyroid hormone and estrogen.
52. In lungs, oxygen diffuses into blood and carbon dioxide diffuses out of blood. This type of respiration is called-
- (1) Inspiration.
 - (2) External respiration.
 - (3) Internal respiration.
 - (4) Tissue respiration.
53. The function of transport epithelia in osmo-regulation is -
- (1) It facilitates movement of solutes.
 - (2) It stimulates kidney to reabsorb water.
 - (3) It facilitates selective removal of large proteins.
 - (4) It is the site of removal of amine group from amino acids.
54. Members of the same species which are capable of inbreeding is best described as -
- (1) Community
 - (2) Population
 - (3) Ecosystem
 - (4) Biotypes



55. Which of the following would cause deviation from Hardy-Weinberg equilibrium?
- (1) Small population.
 - (2) Random mating.
 - (3) Lack of selection pressure.
 - (4) Absence of mutation.
56. Java man is-
- (1) *Pithecanthropus erectus*.
 - (2) *Pithecanthropus pekinesis*.
 - (3) *Homo rhodesiensis*.
 - (4) *Homo hilderbergensis*.
57. Two zoogeographical regions separated by high mountain range are -
- (1) Oriental & Australian.
 - (2) Palearctic & Oriental.
 - (3) Nearctic & Palearctic.
 - (4) Neotropical & Ethiopian.
58. *Ornithorhynchus* (platypus), *Tachyglossus* (ant eater), Kangaroo, *Dasyures*, *Dendrolagus* (climbing kangaroo), *Petaurus* (flying opossum) and wolfs are characteristic mammalian fauna found in-
- (1) Oriental Realm.
 - (2) Palearctic Realm.
 - (3) Australian Realm.
 - (4) Neotropical Realm.
59. The lytic enzymes released by spermatozoa during the fertilization are-
- (1) Ligase and lipase.
 - (2) Acrosin and esterase
 - (3) Lyase and hyaluronidase
 - (4) Acrosin and hyaluronidase



60. Which one of the following cell type is product of meiosis I during spermatogenesis?
- (1) Spermatogonia.
 - (2) Primary spermatocyte.
 - (3) Secondary spermatocyte.
 - (4) Spermatid.
61. In amphibians, the yolk proteins accumulated in oocytes during the oogenesis are primarily synthesized and released in the circulation by -
- (1) Liver
 - (2) Hepato-pancreas
 - (3) Adipose tissue
 - (4) Ovary
62. A placenta in which chorionic tissue penetrates endothelium of maternal blood vessel is known as -
- (1) Endotheliochorial placenta.
 - (2) Haemochorial placenta.
 - (3) Non-deciduate placenta.
 - (4) Epitheliochorial placenta.
63. During amphibian metamorphosis, disappearance of larval organ is mediated by -
- (1) Histogenesis
 - (2) Morphogenesis
 - (3) Histolysis
 - (4) Paedogenesis



64. During the embryonic development in frog, the central nervous system is derived from _____, the axial skeleton is derived from _____ and the muscles of the trunk are derived from _____.
- (1) ectoderm, mesoderm, endoderm.
 - (2) mesoderm, endoderm, endoderm.
 - (3) ectoderm, mesoderm, mesoderm.
 - (4) all are derived from mesoderm.
65. Which of the following engulf foreign materials?
- (1) Macrophages
 - (2) Plasma cells
 - (3) Mast cells
 - (4) Lymphocytes
66. Memory cells are generated from -
- (1) Erythropoietic stem cells.
 - (2) Monocytes.
 - (3) T lymphocytes.
 - (4) B lymphocytes.
67. Which one of the following is smallest cell in the human body?
- (1) Red blood cell
 - (2) Brain cells
 - (3) Egg cell
 - (4) Muscle cells
68. The following is a triploblastic acoelomate animal-
- (1) Rotifer
 - (2) Liver fluke
 - (3) Leech
 - (4) Nematode



69. Deuterostomia is seen in phylum-
- (1) Arthropoda
 - (2) Mollusca
 - (3) Annelida
 - (4) Echinodermata
70. In which of the following pair, the terms are not related?
- (1) analogous structures - butterfly wings.
 - (2) adaptive radiations - convergent evolution.
 - (3) vestigial structure - appendix.
 - (4) evolution - natural selection.
71. Naming organism in scientific term is known as -
- (1) Binomial nomenclature.
 - (2) Trinomial nomenclature.
 - (3) Scientific nomenclature.
 - (4) Numerical nomenclature.
72. The most distinctive character of sponge is -
- (1) Presence of food vacuole.
 - (2) Presence of choanocytes.
 - (3) Asexual reproduction.
 - (4) All are marine animals.
73. Free swimming larval stage of *Obelia* is -
- (1) Planula
 - (2) Ephyra
 - (3) Miracidium
 - (4) Glochidium



74. Bipinnaria larvae is found in the development of -
- (1) Sea lily
 - (2) Starfish
 - (3) Sea urchin
 - (4) Sea cucumber
75. In echinoderms, water vascular system helps in-
- (1) Feeding, locomotion and respiration.
 - (2) Feeding, reproduction and respiration.
 - (3) Respiration, reproduction and locomotion.
 - (4) Mastication, locomotion and reproduction.
76. Hepatic-portal system is found in all -
- (1) Amniotes only.
 - (2) Anamniotes only.
 - (3) Amniotes and anamniotes.
 - (4) In mammals only.
77. Which of the following is **correct** pairing of site of action and substrate of rennin?
- (1) Mouth-starch
 - (2) Stomach-fat
 - (3) Stomach-casein
 - (4) Intestine-casein
78. Which of the following birds takes up longitudinal migration?
- (1) Coot
 - (2) Starling
 - (3) Violet Green Swallow.
 - (4) American Golden Plover.



79. When vesicles in cytoplasm combine with plasma membrane excreting hormones and other molecules out of the cell, then this process is called-
- (1) exocytosis
 - (2) endocytosis
 - (3) excretion
 - (4) engulfing
80. In cell cycle, DNA synthesis occurs during-
- (1) G1 phase
 - (2) G2 phase
 - (3) S phase
 - (4) M phase
81. Peptide bond formation between amino acid of growing polypeptide chain is catalyzed by-
- (1) Peptidyl synthetase.
 - (2) Aminoacyl-tRNA synthtase.
 - (3) Peptidyl polymerase.
 - (4) Peptidyl transferase.
82. The enzyme which facilitates mRNA synthesis in eukaryotes -
- (1) RNA polymerase I.
 - (2) RNA polymerase II.
 - (3) RNA polymerase III.
 - (4) Reverse transcriptase.
83. When populations in an area are not geographically isolated, they interbreed and develop a distinct lifestyle, named as :
- (1) Allopatric speciation.
 - (2) Sympatric speciation.
 - (3) Parapatric speciation.
 - (4) Speciation.



84. Outer layer of dermis is termed as -
- (1) Papillary layer.
 - (2) Reticular layer.
 - (3) Spongy layer.
 - (4) Specialized layer.
85. Function of pancreatic cell **does not** include -
- (1) Secretion of insulin.
 - (2) Secretion of glucagon.
 - (3) Secretion of enzymes.
 - (4) Deamination of amino acids.
86. Which of the following structure in human ovary is responsible for the secretion of progesterone?
- (1) Primordial follicle.
 - (2) Primary follicle.
 - (3) Antral follicle.
 - (4) Corpus leuteum.
87. Membrane surrounding bone is called-
- (1) Periostium
 - (2) Pericardium
 - (3) Perichondrium
 - (4) Endosteum
88. Leydig cells are found in -
- (1) Ovary
 - (2) Pituitary
 - (3) Hypothalamus
 - (4) Testis



89. Which of the following defines an ecosystem?
- (1) The community of organisms together with the environment in which they inhabit.
 - (2) Various communities of organisms which interact with one another in a given niche.
 - (3) The abiotic component of a given region.
 - (4) Exclusive community of a living organism in a given area.
90. Which of the following is called as sedimentary biogeochemical cycle?
- (1) Oxygen cycle
 - (2) Nitrogen cycle
 - (3) Hydrogen cycle
 - (4) Phosphorous cycle
91. The association of animals when both the partners are benefitted is known as-
- (1) Cooperative colony
 - (2) Commensalism
 - (3) Mutualism
 - (4) Neutralism
92. Model that demonstrates how energy passes from one organism to another organism is called-
- (1) An energy link.
 - (2) A food chain.
 - (3) A phytoplankton cycle.
 - (4) A consumer cycle.



93. Food chain in which micro-organisms breakdown the food produced by the primary producers is known as-
- (1) Detritus food chain.
 - (2) Consumer food chain.
 - (3) Parasitic food chain.
 - (4) Predator food chain.
94. The process of successful establishment of a species in a new area is called as -
- (1) Stabilization
 - (2) Nudation
 - (3) Invasion
 - (4) Ecesis
95. Which one of the following is a biodiversity hot spot in India?
- (1) Leh
 - (2) Eastern Ghats
 - (3) Western Ghats
 - (4) Western Himalaya
96. The group of vertebrate which comprises the highest number of endangered species-
- (1) Fishes
 - (2) Reptiles
 - (3) Birds
 - (4) Mammals



97. The following contribute maximally to environmental pollution in present times -
- (1) Plants
 - (2) Human
 - (3) Fungi
 - (4) Hydrocarbon gases
98. UV radiation from sunlight promotes the production of _____, a harmful gas which is a serious environmental pollutant -
- (1) Fluorine
 - (2) Ozone
 - (3) Carbon monoxide
 - (4) Sulphur dioxide
99. Which of the following is a rare autosomal recessive inheritance genetic disorder?
- (1) Alkaptonuria.
 - (2) Huntington's disease.
 - (3) Hereditary spherocytosis.
 - (4) Myotonic dystrophy.
100. The transcription of lac repressor from the lac I gene is -
- (1) Dependent on glucose concentration in the cell.
 - (2) Independent of lac operon genes.
 - (3) Dependent on galactose concentration in the cell.
 - (4) Dependent on lac operon genes.



(Space for Rough Work)



(Space for Rough Work)

