

W-122

Ph.D. Entrance Examination, 2024

LIFE SCIENCES*Maximum Marks : 50***Note :** Each question carrying 2 marks.**Q. 1.** Two pitch of α -helix of a protein composed of

_____ aminoacids :

- (a) 10
- (b) 3.4
- (c) 6.8
- (d) 34

Q. 2. Which of the following amino acid does not have a chiral center ?

- (a) Alanine
- (b) Tyrosine
- (c) Glycine
- (d) Glutamate

Q. 3. Q-cycle is related to which respiratory chain complex :

- (a) Complex - I
- (b) Complex - III
- (c) Complex - II
- (d) Complex - IV

Q. 4. A cell has four DNA and four chromosomes. How many DNA and chromosome do you expect after Anaphase-I in each daughter cell ?

(3)

- (a) Four DNA and Four chromosomes
- (b) Two DNA and Two chromosomes
- (c) Four DNA and Two chromosomes
- (d) Eight DNA and Four chromosomes

Q. 5. Which of the following DNA polymerase in *E. coli*

has both 3'–5' exonuclease and 5'–3' exonuclease activity :

- (a) DNA Pol. I
- (b) DNA Pol. II
- (c) DNA Pol. III
- (d) DNA Pol. ϵ

(4)

Q. 6. Total ATP equivalents required for the synthesis of a aminoacyl-tRNA synthesis ?

- (a) One
- (b) Two
- (c) Three
- (d) Four

Q. 7. Which of the following is NOT a typical STOP codon in Eukaryotes ?

- (a) UAA
- (b) UGA
- (c) UAG
- (d) AUG

(5)

Q. 8. The antigen present on the MHC-II by an antigen

presenting cell is recognised by :

- (a) CD⁴⁺ T-Cell
- (b) CD⁸⁺ T-Cell
- (c) Both (a) and (b)
- (d) B-Cell

Q. 9. Which of the following is related to Type I

hypersensitivity :

- (a) Allergen
- (b) Atopic
- (c) IgE
- (d) All the above

W-122

P.T.O.

(6)

Q. 10. In a saturated antigen-antibody complex ratio of

antigen : antibody is :

- (a) 1 : 2
- (b) 2 : 1
- (c) 1 : 1
- (d) None

Q. 11. Amytol inhibits the electron transport in ETC

complex :

- (a) I
- (b) II
- (c) III
- (d) IV

W-122

(7)

Q. 12. Which of the following is a multienzyme complex :

- (a) Pyruvate dehydrogenase
- (b) α -Ketoglutarate dehydrogenase
- (c) Both (a) and (b)
- (d) Succinate dehydrogenase only

Q. 13. Depolymerization phase in action potential is initiated by opening of :

- (a) Voltage gated sodium channel
- (b) Voltage gated potassium channel
- (c) Ligand gated sodium channel
- (d) Pressure sensitive sodium channel

W-122

P.T.O.

(8)

Q. 14. A cross between two homozygous parents with contrasting characters is called :

- (a) Monohybrid cross
- (b) Test cross
- (c) Dihybrid cross
- (d) Back cross

Q. 15. In a family Father has blood group 'A' and Mother has blood group 'B'. One of their daughters has blood group 'O'. Genotype of father and mother would be :

- (a) $I^A i$ and $I^B i$
- (b) $I^A I^A$ and $I^B i$

W-122

(9)

(c) I^AI^B and ii

(d) I^Ai and I^BI^B

Q. 16. The CO₂ compensation point of C₃ plants is greater than C₄ plants because C₃ plants :

(a) Dark respiration is higher

(b) Photo respiration is absent

(c) Photo respiration is present

(d) Dark respiration is lower

Q. 17. In Metazoan cell cycle, metaphase to anaphase transition is regulated by the activity of :

(a) Cdc 25

(b) APC/C

W-122

P.T.O.

(10)

(c) Cdk1/CyclinB

(d) Wee1

Q. 18. In mammals, the primary circadian clock is located in which part of the brain ?

(a) Occipital lobe of cerebellum

(b) Suprachiasmatic nucleus

(c) Frontal lobe of cerebellum

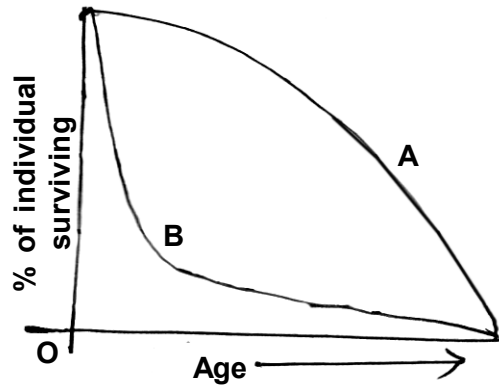
(d) Amygdala

Q. 19. Given below are the survivorship curves showing the proportion of individuals surviving over time or age. Two generalized types of curves (A and B) are depicted below. Which of the following

W-122

(11)

represents the correct survivorship curve for a given organism ?



- (a) A = Elephant B = Lizards
- (b) A = Oyster B = Elephant
- (c) A = Elephant B = Oyster
- (d) None

Q. 20. Antidiuretic hormone acts on which part of nephron :

W-122

P.T.O.

(12)

- (a) Bowman
- (b) DCT
- (c) PCT
- (d) Loop of Henle

Q. 21. Origin of first land vertebrates occurred in which period of Geological time scale :

- (a) Cambrian period
- (b) Jurassic period
- (c) Cretaceous period
- (d) Devonian period

Q. 22. A DNA fragment was treated with EcoRI and produces the three smaller fragment of DNA of

W-122

(13)

size 100 bp (A), 300 bp (B) and 210 bp (C). The DNA fragments were separated by agarose Gel Electrophoresis position of the DNA fragments from negative terminal to positive terminal in the Gel is :

- (a) ABC
- (b) BCA
- (c) BAC
- (d) CAB

Q. 23. Which of the following components is expected to be the most abundant in phloem sap of a plant ?

W-122

P.T.O.

(14)

- (a) Protein
- (b) Lignin
- (c) Sugar
- (d) Organic acids

Q. 24. A light microscope objective has magnification 10X and eye piece has magnification 5X. Total magnification of the microscope is :

- (a) 15X
- (b) 50X
- (c) 20X
- (d) 25X

W-122

(15)

Q. 25. What is primary function of pair-rule genes in the early embryonic development of *Drosophila* :

- (a) Establishing segment boundaries
- (b) Refining the position of parasegments
- (c) Determining the identity of individual segments
- (d) Dividing embryo into broad regions

