M.Phil. Biochemistry Entrance Examination

Time: 2Hrs

Marks: 100

Part A

Underline the right choice

Answer all questions. Each carries 2 marks (25x2=50)

1. The volume of 2N sulphuric acid to be taken to prepare 100 ml of its 0.1M solution is

a. 1ml   b. 2ml   c. 10 ml   d. 0.2 ml

2. The transport of Glucose across cell membrane with the help of Glu transporter is an example of

a. simple diffusion   b. facilitated diffusion

c. active transport   d. enzyme driven active transport

3. Resonance causes the peptide bonds to

a. be more reactive compared to similar bonds   b. be quite rigid and nearly planar

c. decrease the polarity   c. exhibit less dipole moment in the favored trans configuration

4. In MALDI- TOF analysis of biomolecules

a. the analyte remain un-ionised   b. laser is used for irradiation

c. proteins cannot be analysed   d. amino acids cannot be analysed

5. In the separation of macromolecules using PAGE, bis- acrylamide is used

a. for the decomposition of persulphate ions   b. to remove undissolved oxygen

c. to form free radicals   d. as a cross linking agent between acrylamide monomers

6. In a cell and its environment Na^+-K^+ ATPase maintains

a. High internal K^+ concentration   b. Low internal K^+ concentration c. high internal Na^+ concentration d. the same internal and external concentrations of K^+

7. Synthesis of steroid hormones in the cells of gonad and adrenal cortex takes place in

a. Ribosomes b. nucleus c. smooth endoplasmic reticulum d. mitochondria

8. In competitive enzyme inhibition,

a. Km remains unchanged   b. Vmax remains unchanged

c. Both Km and Vmax are changed   d. Both Km and Vmax remain unchanged

9. The solubility of most proteins is lowered at high salt concentrations. This principle is used for the purification of proteins by

a. Salting in process   b. Salting out process   c. Isoelectric focussing d. None of these

10. Precision of a clinical measurement is

a. Closeness of the result to the true value   b. how close repeated measures of the same sample lie   c. result given by only one substance will answer a particular test   d. None of the above

11. α-D-glucose and β -D-glucose are

a. Stereoisomers   b. Epimers   c. Anomers   d. Keto-aldo pairs

12. Identify the antiapoptotic protein

a. BAD   b.BAX   c.BCL-2   d. BAK

13. Immunoglobulins are classified on the basis of

a. Type of light chains   b. Type of heavy chains

c. Types of light and heavy chains   d. Molecular weight

14. Avidity of an antigen- antibody complex depends on

a. the valency of the antibody and antigen

b. geometric arrangement of the interacting components

c. intrinsic affinity of the antibody to the epitope

d. All of the above

15. The DNA Cot curve represents

a. The atomic spacing in DNA   b. The molecular spacing in DNA

 c. DNA re-association kinetics   d. None of the above

16. An enzyme which is involved in both glycogenesis and glycogenolysis is

a. Branching enzyme   b. Phosphoglucomutase   c. Glucose 6-phosphatase

d. Hexokinase

17. The plant hormone which helps in fruit ripening is

a. Auxin   b. Gibberellin   c. Cytokinin   d. Ethylene

18. Which enzyme is used to remove DNA-RNA hybrid?

a. DNAase   b. RNAse H   c. Topoisomerase   d. Endonuclease

19. A method to identify and evaluate the size, shape, and number of chromosomes in a sample of eukaryotic cells is called

a. chromosome walking   b. chromosome jumping

c. karyotyping   d. finger printing

20. In the process of animal development, embryo gets 3 primary cell layers-the germ layers during

a. cleavage   b. formation of blastula   c. gastrulation   d. neurulation

21. . Rickets is caused due to the deficiency of

a. Vitamin A   b. Vitamin D   c. Vitamin E   d. Vitamin K

22. A genetic code that codes for amino acid sequence of a complete functional polypeptide could be termed as

a. Recon   b. Intron   c. Exon   d. Cistron

23. The competitive ELISA can be used

a. to detect very small amounts of antigen   b. to detect antibody associated with allergies

c. both (a) and (b)   d. to detect trace amounts of any molecule

24. The conversion of trypsinogen to trypsin is an example of

a. Reversible covalent modification   b. Irreversible covalent modification

c. Allosteric regulation   d. Repression

25. The computer program PHYLIP is the abbreviation of

a. Protein Hydroxylation Inference Program

b. Protein Hydroxylation Inference Package

c. Phylogeny Inference Program

d. Phylogeny Inference Package

Part B

Answer all questions. Each carries 10 marks (5x10=50)

26. a. Describe the importance of Ramachandran plot.   5 marks

     b. Write a note on DNA melting   5 marks

27. a. In an mRNA the codon at 5' end is for Alanine. On translation of this, at which end you find Alanine?   3 marks

     b. Length of a DNA is 680 Å. Find the number of base pairs and number of turns if it is

      i) A DNA ii) B DNA iii) Z DNA   7 marks

28. In an enzyme purification protocol the final activity obtained was 80 units/ mg protein. The recovery was 28%, 63% and 89% respectively in the first, second and third stages of purification. Find out the activity of enzyme in each stage.   10 marks

29. a. For an estimation, 1.3 ml aliquot was taken from a stock of 0.2% solution. What will be the amount of material in µg in this aliquot?   5 marks

      b. What do you mean by a mM (milli molar) solution? How will you prepare a 2ml system of 2mM? Assume molecular weight is 180.   5 marks

30. a.In a GTT experiment, the peak blood glucose value was found to be 170 mg/dl. How do you interpret the situation?   5 marks

b. Write a note on ANNOVA.   2 marks

c. Find out the Standard deviation and standard error of the following values.

6.3, 7.2, 9.5, 10.5, 12.0, 12.5, 13.5   3 marks