1. Proteins may be separated according to size by
   (a) reverse phase chromatography
   (b) ion exchange chromatography
   (c) molecular exclusion chromatography
   (d) isoelectric focussing

2. Which of the following has a quaternary structure?
   (a) α-chymotrypsin (b) Haemoglobin
   (c) Insulin (d) Myoglobin

3. Which of the following anti-tumour agent acts by impairing the *de novo* purine synthesis?
   (a) Cytosine arabinoside (b) 5-fluorouracil
   (c) Methotrexate (d) Hydroxyurea

4. Which of the following is a conservative substitution?
   (a) Val to Ile (b) Asp to Pro
   (c) Lys to Leu (d) Trp to Ala

5. Cyclic AMP activates all except one of the following molecules.
   (a) Glycogen phosphorylase
   (b) Hexokinase
   (c) 6-phosphofructokinase-1-kinase
   (d) Protein kinase A

6. Which of the following statements is correct in case of glycoproteins?
   (a) May contain 95% or more of carbohydrate
   (b) Have the carbohydrate linked to the protein by either N or O-glycosidic bonds
   (c) Found only on cell membranes
   (d) Always contain a serially repeating carbohydrate unit

7. Phospholipids are involved in all except one of the following
   (a) cell-cell recognition
   (b) signal transduction
   (c) surfactant function in the lungs
   (d) mediator of hypersensitivity

8. Insulin-dependent diabetes mellitus is associated with
   (a) high levels of insulin
   (b) severe weight gain
   (c) destruction of β-cells of pancreas
   (d) mutation of insulin receptor

9. The Z-DNA helix
   (a) has fewer base pairs per turn than the B-DNA
   (b) is favoured by an alternating GC sequence
   (c) tends to be found at the 3′ end of genes
   (d) is the most common conformation of DNA

10. Formation of a mature insulin does not include
   (a) removal of a signal peptide
   (b) disulphide bond formation
   (c) removal of a peptide from an internal region
   (d) cyclization of a glutamate residue

11. How many energy bonds are expended in the formation of a peptide bond?
   (a) 2 (b) 4
   (c) 3 (d) 6

12. A technique for defining gene arrangement in very long stretches of DNA (50-100 kb) is
   (a) RFLP (b) chromosome walking
   (c) Nick translation (d) Southern blotting

13. Receptors for steroid hormones are found
   (a) on cell membranes
   (b) in cytoplasm
   (c) in mitochondria
   (d) on ribosomes

14. Platelet aggregation is
   (a) initiated at the site of injury by the conversion of fibrinogen to fibrin
   (b) causes release of serotonin
   (c) is inhibited by uninjured blood vessels by the secretion of prostacyclins
   (d) is inhibited by ADP and thromboxane

15. Oral administration of large amounts of tyrosine may interfere with the intestinal absorption of
(a) leucine (b) glycine
(c) aspartate (d) All of these

16. In the 3-dimensional structure of immunoglobulin G
(a) free SH-groups are conserved to function in binding of antigen
(b) C_H and V_H association form the complementary antigen binding sites
(c) the predominant secondary structure is α-helix
(d) hinge regions connect the globular domains

17. Changes in protein conformation can be detected by
(a) ultraviolet absorption spectroscopy
(b) fluorescence emission
(c) circular dichroism
(d) All of the above

18. Endonuclease is an enzyme that hydrolyzes
(a) a nucleotide at the 3′ end of an oligonucleotide
(b) a phosphodiester bond located in the interior of a polynucleotide
(c) a nucleotide from either terminii of an oligonucleotide
(d) a peptide bond located in the interior of a polypeptide

19. The K_m of an enzyme is
(a) one half of the V_{max}
(b) a disassociation constant
(c) the substrate concentration that gives maximal velocity
(d) the substrate concentration that gives half maximal velocity

20. The class of immunoglobulins most abundant in body fluids is
(a) IgM (b) IgG
(c) IgA (d) IgE

21. Which of the following statements is correct in case of chaperone proteins?
(a) These do not prevent aggregation
(b) They cleave incorrect S-S bonds
(c) They act on fully synthesized polypeptides
(d) These are involved in the transport of proteins across mitochondria and endoplasmic reticulum

22. One of the following participates in phagocytic activities.
(a) Neutrophils (b) Mast cells
(c) T-cells (d) Thrombocytes

23. The basal metabolic rate
(a) is not influenced by energy intake
(b) increases in response to starvation
(c) increases in direct proportion to energy expenditure
(d) decreases during periods of starvation

24. Operons
(a) are of approximately uniform in size
(b) do not bind proteins
(c) are found in all eukaryotic genes
(d) are shorter and smaller in lower eukaryotes than higher eukaryotes

25. In humans, fatty acids
(a) can be synthesized from excess dietary carbohydrate or protein
(b) must be supplied entirely by diet
(c) are not required at all in the diet
(d) containing double bonds cannot be synthesized