

1. The pH of 1 mM HCl is

- (a) 1
- (b) 0
- (c) 2
- (d) 3

2. The length of an  $\alpha$  helical section of a polypeptide chain of 20 residues would be

- (a) 30 Å
- (b) 20 Å
- (c) 5.4 Å
- (d) 3.6 Å

3. Which one of these reagents is best suited for identification of the amino terminal residue of a peptide of which you have less than 0.1  $\mu$ g?

- (a) Performic acid
- (b) Dansyl chloride
- (c) Fluoro dinitrobenzene
- (d) Cyanogen bromide

4. If a solution of double-stranded DNA is heated above its melting temperature, its absorbance will,

- (a) decrease
- (b) increase
- (c) remain unchanged
- (d) initially increase and then decrease

5.  $\beta$ -amylase cleaves

- (a)  $\alpha$  (1-4) glycosidic bonds
- (b)  $\beta$  (1-4) glycosidic bonds
- (c)  $\alpha$  (1-6) glycosidic bonds
- (d)  $\beta$  (1-6) glycosidic bonds

6. Gangliosides contain

- (a) a ceramide structure
- (b) glucose or galactose
- (c) sialic acid
- (d) All of the above

7. A southern transfer of *E. coli* DNA after complete digestion with *Eco* RI was probed with labelled C-DNA probe of a gene which occurs only once in the *E. coli* genome. If the gene contains one *Eco* RI cleavage site

near its centre, the number of radioactive bands you are most likely to find on autoradiography would be

- (a) 0
- (b) 1
- (c) 2
- (d) 3

8. The largest energy reserve (kilocalories) in humans is

- (a) blood glucose
- (b) liver glycogen
- (c) muscle glycogen
- (d) adipose tissue triacylglycerol

9. Both strands of DNA serve as templates concurrently in

- (a) replication
- (b) mismatch repair
- (c) excision repair
- (d) All of the above

10. In which of the following does the inner surface of a closed membrane or vesicle become the outer surface of a closed membrane or vesicle?

- (a) Fusion of two intracellular vesicles
- (b) Transfer of an endoplasmic reticular membrane into Golgi membrane via vesicle
- (c) Exocytosis of a secretory vesicle
- (d) Division of a bacterial cell

11. Enzyme Linked Immunosorbent Assay used to detect antigens or antibodies utilizes those enzymes that

- (a) have a high turnover rate
- (b) yield a stable coloured product
- (c) are stable on conjugation to proteins
- (d) All of the above

12. Which of the following hormones uses cyclic AMP as the second messenger?

- (a) Follicle stimulating hormone
- (b) Insulin
- (c) Progesterone
- (d) Gonadotropin releasing hormone

13. IgM class of antibodies are more effective than IgG in bringing about complement mediated lysis because
- IgM has higher affinity for complement components
  - IgM has higher affinity for antigen binding
  - IgM is a pentamer
  - IgM is present in higher concentration
14. Which of the following statements is false?
- MHC class-II molecules are present on all nucleated cells
  - MHC class-II molecules are made up of two polypeptides
  - MHC class-I molecules are present on all nucleated cells
  - T-cell response is MHC-restricted
15. Which of these substrates is best suited for measuring RNA synthesis by RNA polymerase?
- $\gamma P^{32}$  ATP
  - $\alpha P^{32}$  d ATP
  - $\gamma P^{32}$  d ATP
  - $\alpha P^{32}$  UTP
16. The tripeptide sequence encoded by the following polydeoxyribonucleotide sequence, 5'CCC AAA TAC 3', would be
- Pro Lys Tyr
  - Met Phe Gly
  - Met Gly Lys
  - Met Phe Lys
17. All of the following are true about transposons except
- transposons move from one location to a different one within a chromosome
  - both donors and target sites must be homologous
  - transposons may activate a gene
  - transposons may inactivate a gene
18. The class of immunoglobulins that can get transported across epithelial cells is
- IgG
  - IgE
  - IgA
  - IgM
19. A muscle extract is dialyzed exhaustively against 10 mM sodium phosphate buffer, pH, 7.0. The extract does not contain any ATPase activity. If ATP is now added, the following cofactor that also must be added to convert glucose to glucose-6-phosphate is
- $NAD^+$
  - $FADH_2$
  - $Mg^{2+}$
  - $Fe^{3+}$
20. Injection of dinitrophenol (DNP) into a rat causes an immediate increase in its body temperature, because
- DNP acts as an inhibitor of mitochondrial ATPase
  - DNP blocks the electron transport chain
  - DNP inhibits succinic dehydrogenase
  - DNP uncouples electron transport from oxidative phosphorylation
21. A rat liver extract is treated with avidin. Which of the following conversion in gluconeogenesis will not occur?
- Glyceraldehyde 3-P  $\rightarrow$  Glucose-6-phosphate
  - Malate  $\rightarrow$  Oxaloacetate
  - Pyruvate  $\rightarrow$  Phosphoenol pyruvate
  - Fumarate  $\rightarrow$  Phosphoenol pyruvate
22. The direct effect of cyclic AMP in the protein kinase A pathway is to
- activate adenylate cyclase
  - dissociate regulatory subunits from protein kinase A
  - phosphorylate protein kinase A
  - release hormones from target tissue
23. The active site amino acid residue that could be involved in a reaction catalyzed by an enzyme with a pH optimum of 4 would be
- arginine
  - cysteine
  - serine
  - glutamate
24. The isoelectric pH of  $\gamma$  globulin, human serum albumin (HSA) ribonuclease (RNase) and hen egg lysozyme (HEL) are 6.6, 4.9, 7.8 and 11.0 respectively. The order in which these proteins will be eluted from a CM cellulose ion exchange column by an increasing salt gradient at pH 7.0 would be
- HSA,  $\gamma$  globulin, RNase and HEL
  - HEL, RNase,  $\gamma$  globulin, HSA
  - HEL,  $\gamma$  globulin, RNase, HSA
  - HSA, RNase, HEL,  $\gamma$  globulin
25. A solution contains DNA polymerase I,  $Mg^{2+}$  salts and dNTPs. Which of these molecules would acts as template and lead of DNA synthesis?
- Single-stranded RNA base paired with a primer with a free 3' OH group
  - Single-stranded DNA base paired with a primer with a free 5' OH group
  - Single-stranded DNA base paired with a primer with a free 3' OH group
  - Double-stranded DNA base paired with a free 3' OH group at each end