1 Mark Questions

1. The most abundant atom in a living organism is
   (a) hydrogen (b) oxygen
   (c) nitrogen (d) carbon

2. The coenzyme involved in transfer of carboxyl group is
   (a) NADH
   (b) coenzyme-A
   (c) S-adenosyl methionine
   (d) biotin

3. The unit of length 'Angstrom' equals to
   (a) 10^{-6}m (b) 10^{-8}m
   (c) 10^{-10}m (d) 10^{-15}m

4. Which of the following triplet does not code for any amino acid?
   (a) UUA (b) UCA
   (c) UAA (d) UGU

5. Erythrocytes resist shearing forces while travelling through narrow blood vessels because they contain the meshwork of
   (a) glycophorin-A (b) spectrin
   (c) haemoglobin (d) myoglobin

6. Tetrodotoxin, a highly poisonous toxin from Puffer fish acts on
   (a) sodium channel (b) potassium channel
   (c) chloride channel (d) calcium channel

7. Electron flow in cytochrome oxidase in the respiratory chain can be blocked by
   (a) retenone (b) amytal
   (c) cyanide (d) cycloheximide

8. In case of humans, passive immunity observed in newborn child is due to the passage of the following immunoglobulin from the mother to the child through placenta
   (a) IgD (b) IgE
   (c) IgM (d) IgG

9. In eukaryotic cells around 5′, cytosine residues are methylated the methylation most commonly occurs in the following sequence
   (a) CpA (b) CpT
   (c) CpG (d) CpC

10. The following reagent will not release the integral proteins from the plasma membrane
    (a) sodium chloride
    (b) triton X-100
    (c) sodium dodecyl sulphate
    (d) NP-40

2 Marks Questions

11. The biochemical reactions leading from glucose to the generation of glyceraldehyde 3-phosphate consume ATP. The numbers of ATP molecules consumed for the conversion of one molecule of glucose to glyceraldehyde 3-phosphate is
    (a) 2 (b) 1
    (c) 3 (d) 4

12. Monoclonal antibodies were raised against three different proteins containing unique epitopes. All the monoclonal antibodies were mixed together and placed in one of the wells in an Ouchterlony Double Diffusion plate. Similarly, all three proteins were mixed together and placed in the adjacent well. The number of precipitin bands observed after incubation are
    (a) 3 (b) 2
    (c) 1 (d) 0

13. L-19 RNA from the protozoan *Tetrahymena* was demonstrated to have two enzymatic activities and these activities are
    (a) RNA polymerase, DNA polymerase
    (b) ribonuclease, RNA polymerase
    (c) ribonuclease, deoxyribonuclease
    (d) ribonuclease, protease

14. A single stranded DNA of unknown size can not be distinguished from a double stranded DNA by
(a) analysis of base composition
(b) thermal denaturation
(c) density gradient ultracentrifugation
(d) gel electrophoresis

15. Telomerase is an enzyme whose macromolecular composition is
(a) lipoprotein only (b) ribonucleoprotein only
(c) ribonucleic acid only (d) protein only

16. The molecular weight of IgG-antigen complex at antigen excess is 300Kd. The molecular weight of antigen is
(a) 75 (b) 50
(c) 100 (d) 150

17. The net reaction of the citric acid cycle is
(a) Acetyl Co-A + $2NAD^+$ + FAD + GDP + Pi + $2H_2O \longrightarrow 2CO_2$ + $2NADH + FADH_2 + GTP + 2H^+$ + Co-A
(b) Acetyl Co-A + $3NAD^+$ + FAD + GDP + Pi + $2H_2O \longrightarrow$ $2CO_2 + 3NADH + FADH_2 + GTP + 2H^+$ + Co-A
(c) Acetyl Co-A + $2NAD^+$ + 2FAD + 2GDP + 2Pi + $2H_2O \longrightarrow$ $2CO_2 + 2NADH + 2FADH_2 + 2GTP$ + Co-A
(d) Acetyl Co-A + NAD^+ + FAD + GDP + Pi + $H_2O \longrightarrow$ $2CO_2 + NADH + FADH_2 + GTP$ + Co-A

18. Genetic variation between individuals within a species involving different alleles at a locus is called
(a) isotypic variation
(b) idiotypic variation
(c) allotypic variation
(d) haplotypic variation

19. A pentameric IgM molecule was electrophoresed on a reducing SDS-Polyacrylamide gel. How many bands one can expect?
(a) 1 (b) 2
(c) 3 (d) 4

20. Viral encoded RAS oncogene transforms normal mammalian cells into cancer cells. Viral RAS protein differs from its normal counterpart by
(a) diminished GTPase activity
(b) increased GTPase activity
(c) diminished ATPase activity
(d) increased ATPase activity

21. Choose the correct match groups.

Group I	Group II
A. Immunodeficiency disease	1. Hexosaminidase-A
B. Tay-Sach disease	2. Hypoxanthine-guanine phosphoribosyl-transferase
C. Lesch-Nyhan syndrome	3. Chloride channel
D. Cystic fibrosis	4. Adenosine deaminase

Codes

	A	B	C	D
(a)	1	3	4	2
(b)	3	2	4	1
(c)	4	1	2	3
(d)	2	4	3	1

22. Choose the correct match groups.

Group I	Group II
A. β-ketoacyl ACP synthase	1. Reduces double bound forming saturated acyl ACP
B. β-ketoacyl ACP reductase	2. Reduces β-keto group to β-hydroxy group
C. Enoyl ACP-reductase	3. Condenses acyl and malonyl group
D. Acyl carrier protein (ACP)	4. Carries acyl group in thioester linkages

Codes

	A	B	C	D
(a)	2	1	3	4
(b)	3	2	1	4
(c)	4	1	2	3
(d)	3	1	2	4

23. A DNA was labelled at its 5′ end using γ ^{32}P-ATP. Choose the correct combination from the following options to separate the free γ ^{32}P-ATP from γ ^{32}P labelled DNA
A. γ^{32}P-ATP can be removed by treating the sample with phosphatases.
B. The labelled samples can be electrophoresed and blotted onto nitrocellulose membrane and then labelled DNA can be recovered from nitrocellulose membrane.
C. Sample can be passes through a gel filtration column to separate free γ ^{32}P-ATP.

D. DNA can be precipitated using ethanol to separate it from contaminating γ ^{32}P-ATP.

(a) A and B (b) A and D
(c) C and D (d) B and C

24. A team of researchers had used the following eluting buffers to prepare an anti albumin IgG from an anti IgG affinity column,
Buffer A : 0.1M Glycine-HCl, pH 3.0
Buffer B : 0.1M Sodium acetate, pH 6.0
Buffer C : 0.1M Sodium phosphate, pH 7.0
Buffer D : 0.1M Tris-HCl, pH 8.0
Which of the above buffers can be used for anti albumin IgG elution?

(a) Buffer A (b) Buffer B
(c) Buffer C (d) Buffer D

25. Oligosaccharide chain is added to the asparagine residue of a newly synthesized protein on the luminal side of the endoplasmic reticulum membrane. The Asparagine of the newly synthesized protein that is linked to oligosaccharide chain is a part of the sequence (x, can be any amino acid other than proline)

(a) Asn-x-Asp (b) Asn-x-Thr
(c) Asn-x-Ile (d) Asn-x-Gly

26. The signal recognition particle' binds to the signal peptide of the protein undergoing synthesis resulting into a pause in the transnational process. The pause in the transnational phenomenon is due to

(a) inactivation of aminoacyl *t*RNA synthetases
(b) inhibits the activity of elongation factor Tu
(c) induced confirmational change in the smaller ribosomal subunit
(d) blockade of the entry of the next aminoacyl *t*RNA for the reaction

27. Which of the following statement is not true with respect to the photosystem II found in the chloroplasts? (Photosystem-I = PS-I, Photosystem-II = PS-II)

(a) PS-II is located in the grana
(b) Chlorophyll molecule in the reaction center for the PS-II is bound to a 110 Kd integral membrane protein
(c) A complex of cytochrome-*b* and *f* transports electrons from PS-II to PS-I
(d) PS-II reaction center is bound to two Mn^{2+} ions

28. Choose the statement that is not correct with respect to the Protein Kinase C (PKC)

(a) activated PKC can phosphorylate the specific tryptophan residue on the target protein
(b) PKC is a Ca^{2+} dependent kinase
(c) PKC can be activated by diacylglycerol
(d) activation of PKC can lead to the activation of MAP kinase

29. 'Enhancer' elements are known to increase the rate of transcription when present at the upstream side of the promoter sequences. If the same enhancer element is placed in reverse orientation.

(a) the rate of transcription increases
(b) the rate of transcription decreases
(c) the rate of transcription remains same
(d) no transcription is observed

30. Choose the group containing only the peptide hormones

(a) vasopressin, oxytocin, epinephrine
(b) vasopressin, testosterone, glucagon
(c) oxytocin, vasopressin, thyroxine
(d) oxytocin, vasopressin, somatostatin