1. Electrons from the excited chlorophyll molecules of PS-II are first accepted by

   a) Photoquinone
   b) Ferredoxin
   c) Cytochrome f
   d) Cytochrome b

2. Consider the following statements regarding species interdependence:
 I. An association of two species where one benefitted and other remains unaffected called mutalism.
 II An interspecific association were both partners derive benefit from each other is called commensalism.
III. A direct food relation between two species of animals in which one animal kills and feeds on another is referred as predation.
IV. A relation between two species of organism where both the partners are benefitted from each other is called symbiosis.

Which of the above statements are true?

   a) I and II
   b) II and III
   c) III and IV
   d) I and III

3. Which one is **not** a toxic phytoplankton?

   a) *Protoperidinium oceanicum*
   b) *Coscinodiscus excentricus*
   c) *Noctiluca scintillans*
   d) *Microcystis aeruginosa/ Dinophysis acuminate*

4. Carbon sequestration is the process of

   a) Capturing and storing atmospheric carbon dioxide.
   b) Release of carbon dioxide from urea by volatilization.
   c) Fixation of carbon by the process of photosynthesis.
   d) Production of CO_2 by burning carbon compounds.

5. According to the available fossil record, which of the following are the first vascular plants?

   a) Horsitales
   b) Cycads
   c) Lycopsids
   d) Psilophytales

6. Which of the following plant hormones is synthesized from methionine?
   a) IAA
   b) Zeatin
   c) Ethylene
   d) GA3

7. 500 ppm is equal to

   a) 0.5 mg/ml
   b) 0.05 mg/ml
   c) 0.05 µg/ml
   d) 0.5 µg/ml

8. Which of the following plant cells undergoes programmed cell death to become functional?

   a) phloem sieve tube member
   b) Xylem vessel memder
   c) Stomatal guard cell
   d) Bundle sheath cell

9. The Phytomediation process includes

    a) Absorption of contaminant by plant roots
    b) Breakdown the contaminants by stimulating soil microflora
    c) Breakdown the contaminants by plant signalling chemicals.
    d) By all the above mentioned processes.

10. Climacteric fruits are

    a) fruits exhibiting increase in respiration before final stage of ripening
    b) fruits exhibiting decrease in respiration before final stage of ripening
    c) fruits exhibiting increase in photosynthesis before final stage of ripening
    d) fruits exhibiting decrease in photosynthesis before final stage of ripening

11. Gram stain components are-

    a) Methyl red, iodine solution, ethanol, safranin, water
    b) Crystal violet, iodine solution, ethanol, light green, water
    c) Crystal violet, iodine solution, ethanol, safranin, water
    d) Crystal violet, iodine solution, acetic acid, safranin, water

12. Allelopathy refers to

    a) inhibition of growth of one species by another by the production of toxins
    b) inhibition of sporulation of pathogen by the host
    c) altering the reproductive cycle of one organism by another
    d) inhibition of growth of one species by another by preventing reproduction

13. In a pond ecosystem, the bottom area where production is less than respiration is termed as

   a) profundal zone
   b) tidal zone
   c) benthic zone
   d) limnetic zone

14. Enzymes such as desaturase, phospholipase and acetyltransferase are very essential for maintainingthe integrity of plasma membrane. These enzymes are involved in:
   a) maintaining the bilayer nature of membrane
   b) maintaining the semi-permeability of membrane
   c) maintaining the fluidity of membrane
   d) maintaining the position of trans-membrane proteins in the membrane

15. Which of the following DNA repair mechanisms is known as the 'cut and patch mechanism'?

   a) Photoreactivation
   b) Nucleotide excision repair
   c) Base excision repair
   d) Mismatch repair

16. All the following are sulphur containing amino acids found in proteins except

   a) Cysteine
   b) Cystine
   c) Methionine
   d) Threonine

17. At isoelectric pH, an amino acid exists as

   a) anion

   b) cation

   c) zwitterion

   d) none of the above

18. During the denaturation of proteins, all of the following are disrupted except

   a) primary structure

   b) secondary structure

   c) tertiary structure

   d) quarternary structure

19. The distance travelled per turn of α-helix in nm is

   a) 0.34

   b) 0.44

   c) 0.54

   d) 0.64

20. Which of the following inhibitors blocks the translation in eukaryotes?

   a) tetracycline

   b) puromycin

   c) cyclohexane

   d) none of the above

21. Reverse transcriptase is:

   a) RNA dependent DNA polymerase

   b) RNA dependent RNA polymerase

   c) DNA dependent DNA polymerase

   d) DNA dependent RNA polymerase

22. Which of the following is not a requirement for protein synthesis?

a) spiliceosome

b) ribosomes

c) peptidyl transferase

d) amino-acetyl-tRNA synthetase

23. If an origin of replication is deleted from a human chromosome, then during the replication

a) the DNA on either side of the deleted origin of replication will be lost

b) the DNA from the left side of the deleted origin of replication will be lost

c) the DNA from the right side of the deleted origin of replication will be lost

d) the DNA from both side of the origin of replication will be replicated

24. Which one of the following best describes the place within the cell where snRNP would be found?

a) In the cytoplasm, near ribosomes

b) In the cytoplasm, near the nucleus

c) In the nucleus, near RNA polymerase II

d) In the nucleus, near RNA polymerase III

25. The average molecular weight of proteins encoded in a eukaryotic genome is about 50,000, and the average molecular mass of amino acids is about 110 Daltons. Estimate how long it will take a cell to translate an mRNA coding for a protein that is 60 times bigger than the average protein. (Assume that the translation rate is two amino acids per second).

a) 15.2 minutes

b) 3.8 minutes

c) 15.2 hours

d) 3.8 hours

26. Many transcription factors form dimers of identical or slightly different subunits when binds to the DNA. Consider the following three explanations for the above phenomenon.

(I) binding affinities of dimers are more than monomers
(II) combinatorial pairing of different subunits can increase the number of DNA binding specificities
(III) a monomer cannot bind to DNA

    a) (I) and (II) are correct explanations, but not (III)
    b) (II) and (III) are correct explanations, but not (I)
    c) (I) and (III) are correct explanations, but not (II)
    d) all three explanations (I), (II) and (III) are correct

27. Assume the number of misprints per page in observing 100 pages is distributed as Poisson. If the number of pages with no misprint is 10, then a good estimate of the average number of misprints in a page of the book is

    a) 0.1
    b) 1
    c) 2.3
    d) 5

28. For a binomial distribution with success probability 0.5,

    a) mean > variance
    b) mean < variance
    c) mean = variance
    d) none of the abovestatements is necessarily true

29. Based on the data on blood sugar level and BMI, the regression equation of MBI on blood sugar was found to be:

$$Y = 0.2X - 2$$

If the correlation co-efficient between X and Y is 0.2, then

a) the means of X and Y are equal, and the variances of X and Y are equal

b) the means of X and Y need not be equal, but the variances of X and Y are equal

c) the means of X and Y are equal, but the variances of X and Y need not be equal

d) neither the means of X and Y need to be equal, nor the variances of X and Y need to be equal.

30. For comparing the means of two normal populations based on two samples of sizes 5 and 6, when the variances are not same, one should use

a) t-test

b) F-test

c) Chi-squares test

d) none of the above tests