Subject: **Botany**
Paper name: **Plant Metabolism, Biochemistry, Thermodynamics**
Paper No: **BOT/VI/CC/21**
Semester: **6th Semester**

A. Multiple choice questions [25 (5 from each unit)]

1. DNA replication starts at a specific point called
   a) okazaki fragments
   b) Origin
   c) primer site
   d) replication fork

2. The environment provided by the wet leaf surface for growth of microorganisms is called
   a) lithosphere
   b) rhizosphere
   c) phyllosphere
   d) hydrosphere

3. Purine/ pyrimidine bases, together with pentose sugar forms
   a) nucleotides
   b) nucleosides
   c) ribose sugars
   d) deoxyribose sugars

4. The replication of lagging strand generates small polynucleotide fragments called
   a) replication bubbles
   b) leading strand
   c) okazaki fragments
   d) replication fork

5. The transfer of amino group ($-NH_2$) of amino acid to carbonyl group of amino acid is called
   a) transamination
   b) Reductive amination
   c) Ammonification
   d) Nitrate assimilation

6. The genetic information in the DNA is transferred to a complementary sequence of RNA and the process is called
   a) transcription

b) translation
c) replication
d) termination

7. Different variants of the same enzyme having identical functions are called
   a) isozymes
   b) coenzymes
   c) allosteric enzymes
   d) apoenzymes

8. Protein synthesis takes place in
   a) ribosomes
   b) mitochondria
   c) nucleus
   d) cytoplasm

9. Certain enzymes, in addition to their protein structure have a non- protein group attached to them called
   a) coenzymes
   b) apoenzyme
   c) allosteric enzymes
   d) isoenzymes

10. Those enzymes which act away from the site of synthesis are known as
    a) endoenzymes
    b) exo-enzymes
    c) coenzymes
    d) allosteric enzymes

11. The primary precursor of IAA in plants is generally held to be
    a) Indole pyruvic acid (IpyA)
    b) Indole acetaldoxime (IAOx)
    c) Tryptophan
    d) Glutamine

12. The main pathway of gibberellic acid synthesis has been worked out in
    a) *Cannabis sativa*
    b) *Phoenix dactylifera*
    c) *Gibberella fujikuroi*
    d) *Gibberella caudatus*

13. Two known antagonists that inhibits ethylene action are CO_2 and
    a) Ca^{2+}
    b) Ag^{2+}
    c) Mn^{2+}
    d) Mg^{2+}

14. Synthesis of ABA involves the cleavage of a C_{40} precursor, a
    a) xanthophyll carotenoid
    b) farnesyl pyrophosphate
    c) Violaxanthin
    d) xanthoxin

15. The key enzyme which catalyzes the conversion of SAM and MTA in regulating ethylene biosynthesis is
    a) polygalacturonase
    b) chlorophyllase
    c) ACC synthase
    d) adenosylmethionase

16. The process of photorespiration is accomplished in 3 different cell organelles viz., chloroplasts, peroxisomes and
    a) Bundle sheath cells
    b) mitochondria
    c) cytoplasm
    d) golgi apparatus

17. In the thylakoid membrane, chlorophyll molecules are organized into clusters (with other pigments and proteins) called
    a) antenna
    b) reaction centres
    c) photosystems
    d) light-harvesting complex

18. Synthesis of ATP via Electron Transport System is called
    a) Oxidative decarboxylation
    b) Non-cyclic photophosphorylation
    c) Cyclic electron transport
    d) Oxidative Phosphorylation

19. Internally the chloroplast is filled with hydrophilic matrix called as
    a) thylakoid
    b) granum
    c) cytosol
    d) stroma

20. Chlorophyll b is almost identical to chlorophyll a except it has a formyl group in place of
    a) amino group
    b) methyl group
    c) keto group
    d) phosphate group

21. Adiabatic process is
    a) One in which heat is gained nor lost by the system
    b) One in which heat is transferred out of the system
    c) One in which heat goes into the system
    d) One in which heat is displaced to the surroundings

22. An arrangement where no energy or matter is exchanged between a system and its surroundings is called
    a) open system
    b) closed system
    c) Isolated system
    d) none of the above

23. If a reaction is being carried out at constant temperature and pressure, the change in quantity is called
    a) entropy
    b) enthalpy
    c) Free energy
    d) internal energy

24. A process where the pressure of the system remains constant, both the volume and temperature changes is called
    a) isobaric
    b) isothermal
    c) adiabatic
    d) isochoric

25. The sum of potential energy and kinetic energy present in the system is called
    a) Gibbs energy
    b) entropy
    c) free energy
    d) Internal energy

B. Fill up the blanks [15 (3 from each unit)]

1. Conversion of elemental nitrogen into nitrogenous compounds by certain microorganisms is called _____
2. Enzymes, topoisomerase and DNA helicase induces the unwinding of complementary strands of duplex DNA helix, this is called _____
3. The starting material of Purines synthesis in a step by step manner is _____
4. The sequential arrangement of amino acids in a protein molecule is known as _____
5. The binding of substrate to the enzyme takes place in the specific site on the surface of enzyme called _____
6. Effectors that enhance the protein's activity are referred to as *allosteric activators*, whereas those that decrease the protein's activity are called _____
7. The phenomenon of applied ethylene, inducing its own synthesis is termed as _____
8. The primary precursor for the formation of IPP and synthesis of gibberellins is _____
9. The relationship between the effects of auxins on nucleic acids and on growth was first demonstrated in 1954 by _____
10. The pentose pathway begins with the glycolytic intermediate _____
11. The NADPH produced by the light reactions provides the electrons for the reduction of carbon dioxide to _____
12. Since glycolate and some other metabolites of Photorespiration are all 2-C compounds, the glycolate metabolism is also called as _____
13. A system where no energy or matter is exchanged between a system and its surroundings is called _____
14. The branch of science which deals with the quantitative relationship between heat and other forms of energies is called _____
15. The second law of thermodynamics addresses questions about spontaneity in terms of a quantity called _____

Key Answers

A. Multiple choice questions

1. b)	2. c)	3. b)	4. c)	5. a)	6. a)	7. a)
8. d)	9. a)	10. b)	11. c)	12. c)	13. b)	14. a)
15. c)	16. b)	17. c)	18. d)	19. d)	20. b)	21. a)
22. c)	23. c)	24. a)	25. d)			

B. Fill up the blanks

1. biological nitrogen fixation
2. melting
3. 5-phosphoribose(R-5-P)
4. primary structure
5. active centre
6. allosteric inhibitors
7. autocatalytic ethylene synthesis
8. acetate
9. F. Skoog
10. glucose 6-P
11. glucose
12. C2—cycle
13. isolated system
14. thermodynamics
15. entropy