

**J.J.College of Arts and Science (Autonomous)**

**Sivapuram, Pudukkottai – 622 422**

**Department of Biochemistry**

**Bridge Course Syllabus**

**(Applicable for the candidates admitted from academic year 2015-2016 onwards)**

**Unit I**

**Basic Concepts of Chemistry**

Atomic and Molecular Masses. Molar Mass and Molar Volume. Equivalent Mass of Acids, Bases and Salts. Periodic classification of elements, Periodic Trends in Properties. Bohr atom model: quantum numbers, shapes of atomic orbital, electronic configuration of atoms, dual property of an electron, Covalent bonds, Ionic or electrovalent bond, Coordinate covalent bond. Bond parameters, Polarity of Bonds. Sigma and Pi bonds. Hybridisation.

**Unit - II**

**Plant physiology**

Photosynthesis: Significance, site of photosynthesis, photochemical and biosynthetic phases, electron transport system, photorespiration, factors affecting photosynthesis, mode of nutrition : autotrophic, heterotrophic, saprophytic, parasitic and insectivorous plants. Plant growth regulators phytohormones: auxins, gibberellins, cytokinins, ethylene and abscisic acid. Photoperiodism and vernalization.

**Unit - III**

**Human physiology**

Cell biology, Muscles: Muscle action, Muscle tone. Respiration: Process of and conduction of heart beat. Blood components, Blood clotting factors. Anticoagulants, Lymph fluid. Brain, Spinal cord, CSF: Thyroid hormones-Insulin and Glucagon-Hormones of Adrenal cortex and Medulla. Reproductive Hormones. Excretion- Nephron. Reproductive system-Brief account of spermatogenesis, Oogenesis, Menstrual cycle-Invitro fertilization-Birth control.

**Unit – IV**

**Microbiology and Biotechnology**

Groups of Microorganisms, Contributors to Microbiology, Branches of Microbiology, Bright Field and Dark Field Microscope, Phase Contrast Microscope, Fluorescence and Electron Microscope. Development of Biotechnology, Advancements in Modern Biotechnology, Tools for Genetic Engineering, Methods of Gene transfer, Screening for Recombinants, Transgenic Plants, Genetically Modified Crops, Applications of Biotechnology.

**Unit V**

**Biomolecules**

Carbohydrates: classification - mono, oligo and polysaccharides. Lipids: Simple lipids and Compound lipids. Lipoproteins. Analysis of oils. Proteins: Structure and classification of amino acids, Structure of protein, Nucleic Acids: DNA and RNA, structure of nitrogen bases, Purines and Pyrimidines. Vitamins and Minerals: fat soluble and water soluble vitamins. Essential micro and macro minerals, sources and functions.

**Reference books:**

1. Basic concept of chemistry, L. J. Malone, T. O. Dolter, 8th Edition
2. Fundamentals of Plant Physiology - Jain V.K
3. Chatterjee C.C., Human Physiology, Medical Allied Agency, Calcutta, 11th edition, 1985.
4. Text Book of Microbiology - Anantha Narayanan R.
5. David Nelson and Michael M, 2017. Lehninger's Principles of Biochemistry, 7th edition.

**Mrs. S. KANITHA, M.Sc., M. Phil.,**  
**Assistant Professor & Head**  
**DEPT. OF BIO-CHEMISTRY**  
**J.J COLLEGE OF ARTS & SCIENCE**  
**PUDUKKOTTAI**

**Dr. J. PARASURAMAN, M.A., M.B.A., M.C.A.,**  
**M.Phil., B.Ed., Ph.D.**  
**PRINCIPAL**  
**J.J. College of Arts and Science**  
**(Autonomous)**  
**J.J. Nagar, Sivapuram Post,**  
**PUDUKKOTTAI-622 422**

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Department of Biochemistry

**Bridge course- August-2022**

**Attendance sheet for-2022-2023**

11/8/22  
12/8/22  
16/8/22  
17/8/22  
18/8/22

S.No	Reg. No	Name of the students						
1	U22BC1001	Gopika P	P	P	P	P	P	P
2	U22BC1002	Jasmin Rose J	P	P	P	P	P	P
3	U22BC1003	Nishanthini R	P	P	P	P	P	P
4	U22BC1004	Pavithra A	P	P	P	P	P	P
5	U22BC1005	Vinitha k	P	P	P	P	P	P
6	U22BC1006	Azhagumanickam S	P	P	P	P	P	P
7	U22BC1007	Muniyan C	P	P	P	P	P	P
8	U22BC1008	Santhosh K	P	P	P	P	P	P
9	U22BC1009	Suriya T	P	P	P	P	P	P
10	U22BC10010	Thangapandiyan S	P	P	P	P	P	P
11	U22BC10011	Vignesh K	P	P	P	P	P	P

Head of the Department

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J.J COLLEGE OF ARTS & SCIENCE  
PUDUKKOTTAI



Principal

Dr.J.PARASURAMAN, M.A., M.B.A., M.C.C.,  
M.Phil., B.Ed., Ph.D.  
PRINCIPAL  
J.J. College of Arts and Science  
(Autonomous)  
J.J. Nagar, Sivapuram Post,  
PUDUKKOTTAI - 622 422.

**J.J. College of Arts and Science (Autonomous)**  
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**Bridge course (2022-2023)**  
**Pre-test-August 2022**

**Time: 1 hr**

**Max. Marks :25**

- 1. Nucleic acids combine with which biomolecule?**
  - (a) Fats
  - (b) Lipids
  - (c) Carbohydrates
  - (d) Proteins
- 2. Nucleotides are linked together to form nucleic acid through**
  - (a) Glycosidic bond
  - (b) Phosphor-di-ester bond
  - (c) Both
  - (d) None
- 3. Nucleotides have how many components?**
  - (a) 2 (b) 3 (c) 4 (d) 5
- 4. The compound does not contain the phosphate group, is**
  - (a) Nucleotide (b) Nucleoside (c) Both (d) None
- 5. Which of the following is purine nucleotide?**
  - (a) Adenine (b) Uracil (c) Thymine (d) All of the above
- 6. Which of the following is pyrimidine nucleotide?**
  - (a) Uracil (b) Cytosine (c) Thymine (d) All of the above

7. **RNA doesn't have**  
(a) Uracil (b) adenine (c) Thymine (d) guanine
8. **Where is RNA present?**  
(a) Mitochondria (b) Nucleolus (c) Cytoplasm (d) Both B and C
9. **Phosphate group is attached to which carbon of pentose sugar**  
(a) C-1 (b) C-2 (c) C-4 (d) C-5
10. **What is the full form of AMP?**  
(a) Adenine mini-phosphate (b) Aldehyde mono-phosphate (c) Alcohol mono-phosphate (d) None of the above
11. **Which of the following protein is the component of nucleoprotein?**  
(a) Proline (b) Arginine (c) Histones (d) All of the above
12. **Number of hydrogen bonds between adenine and thymine?**  
(a) 1 (b) 2 (c) 3 (d) 4
13. **Number of hydrogen bonds between guanine and cytosine?**  
1 (b) 2 (c) 3 (d) 4
14. **Which ratio is constant for DNA?**  
(a)  $A + G / T + C$  (b)  $A + T / G + C$  (c)  $A + C / U + G$  (d)  $A + U / G + C$
15. **The disruption of nucleosomal structure is due to**  
(a) Acetylation (b) Carboxylation (c) Phosphorylation (d) Methylation
16. **Left-handed helix contained nucleic acid is**  
(a) M-RNA (b) T-RNA (c) A-DNA (d) Z-DNA
17. **A phosphodiester bond is present in**  
(a) Nucleic acids in a nucleotide (b) Monosaccharides in a polysaccharide (c) Amino acid in a polypeptide (d) Fatty acid in a diglyceride



18. Uridine present in RNA is

- a) Nucleotides (b) Pyrimidine (c) Purine (d) Nucleoside

19. Nucleic acids are a polymer of nucleotide monomeric units. Each nucleotide consist of

- (a) base--sugar--OH (b) sugar--phosphate (c) base--sugar--phosphate (d) (base--sugar--phosphate)

20. No. of nucleotide found in DNA segment if it contains 100 Adenine and 100 cytosines

- (a) 100 (b) 200 (c) 400 (d) 50

21. Nucleoside contains

- (a) base-sugar (b) base-phosphate (c) base-sugar-phosphate (d) sugar-phosphate

22. The proteins are synthesized at

- (a) Centrosomes (b) Ribosomes (c) Golgi bodies (d) Mitochondria

23. Most abundant Protein is found in


- (a) Cytoplasm (b) Liver (c) Mitochondria (d) Brain

24. Which proteins are called messenger protein?


- (a) Enzymes (b) Hormones (c) Storage (d) Antibodies

25. Example of a digestive enzyme

- (a) Lactase (b) Pepsin (c) Keratin (d) Collagen

  
11/8/22  
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**Department of Biochemistry**  
**Bridge course-2022-2023**  
**Posttest-August 2022**

1. Dolly, the sheep was obtained by a technique known as
  - A. Cloning by gene transfer
  - B. Cloning without the help of gametes
  - C. Cloning by tissue culture of somatic cells
  - D. Cloning by nuclear transfer
2. ELISA is mainly used for
  - A. Detection of mutations
  - B. Detection of pathogens
  - C. Selecting animals having desired traits
  - D. Selecting plants having desired traits
3. Transgenic animals are those which have
  - A. Foreign DNA in some of their cells
  - B. Foreign DNA in all their cells
  - C. Foreign RNA in some of their cells
  - D. Foreign RNA in all their cells
4. Alpha lactalbumin is a protein with \_\_\_\_\_ aminoacids.
  - A. 120
  - B. 133
  - C. 123
  - D. 140
5. The first synthetic vaccine produced was \_\_\_\_\_
  - A. DPT
  - B. HbsAg
  - C. Measles
  - D. Polio
6. Stem cells that can differentiate into various types of cells that are related in an organism is called
  - A. Multipotent
  - B. Oligopotent
  - C. Pluripotent
  - D. Unipotent
7. Most of the adult stem cells are \_\_\_\_\_ and can act as a repair system of the body
  - A. Totipotent
  - B. Multipotent
  - C. Oligopotent
  - D. Pluvipotent



8. \_\_\_\_\_ is an example for DNA vaccine
- A. MMR
  - B. Hepatitis B
  - C. BCG
  - D. oral polio
9. The B-chain of Insulin is composed of \_\_\_\_\_ amino acids
- A. 70
  - B. 30
  - C. 45
  - D. 60
10. The term Biotechnology was coined by \_\_\_\_\_
- A. Karl Ereky
  - B. Sameera
  - C. Joel
  - D. Rosie
11. Restriction enzymes are
- A. Not always required in genetic engineering
  - B. Essential tools in genetic engineering
  - C. Nucleases that cleave DNA at specific sites
  - D. both b and c
12. Some of the characteristics of Bt cotton are
- A. Long fibre and resistant to aphids
  - B. Medium yield, long fibre and resistant to beetle pests
  - C. high yield and production of toxic protein crystals which kill dipteran pests
  - D. High yield and resistant to boll worms
13. Zymology deals with \_\_\_\_\_
- A. Study of yeast fungus and its practical applications
  - B. Study of fermentation and its uses
  - C. Study of Bioreactors and their construction methodology
  - D. Study of zymase producing microbes and its benefits
14. Self-ligation is prevented by \_\_\_\_\_
- A. DNA Polymerase
  - B. Helicase
  - C. Alkaline phosphate
  - D. DNA lipase
15. pUC 19 is an example for \_\_\_\_\_
- A. Shuttle vector
  - B. Expression vector
  - C. Cosmid
  - D. Phagemid vector



16. Pond is a type of
- A. forest ecosystem
  - B. grassland ecosystem
  - C. marine ecosystem
  - D. fresh water ecosystem
17. Solar energy used by green plants for photosynthesis is only
- A. 2 – 8%
  - B. 2 – 10%
  - C. 3 – 10%
  - D. 2 – 9%
18. Which of the following ecosystem has the highest primary productivity?
- A. Pond ecosystem
  - B. Lake ecosystem
  - C. Grassland ecosystem
  - D. Forest ecosystem
19. Ecosystem consists of
- A. decomposers
  - B. producers
  - C. consumers
  - D. all of the above
20. A mRNA molecule is produced by
- A. Replication
  - B. Transcription
  - C. Duplication
  - D. Translation
21. The total number of nitrogenous bases in human genome is estimated to be about
- A. 3.5 million
  - B. 35000
  - C. 35 million
  - D. 3.1 billion
22. The term gene was coined by \_\_\_\_\_
- A. Mendel
  - B. Lyon
  - C. Johannsen
  - D. Hershey
23. \_\_\_\_\_ is unique for DNA.
- A. Adenine
  - B. Uracil
  - C. Guanine
  - D. Thymine



24. DNA sequencers were developed by \_\_\_\_\_.
- A. Frederick Serger
  - B. Watson
  - C. Messelson
  - D. Kornberg
25. A nucleoside is composed of \_\_\_\_\_
- A. Sugar and Phosphate
  - B. Nitrogen base and Phosphate
  - C. Sugar and Nitrogen base
  - D. Sugar, Phosphate and Nitrogenous base

*M.S.K.*  
18/8/22  
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*J.P.*  
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**Bridge course- August-2022**

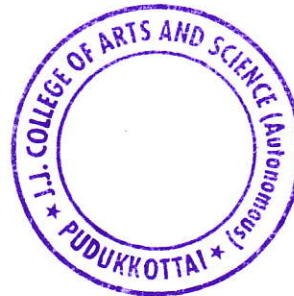
**Mark statement for pre-test -2022-2023**

**Time: 1hr**

**Max. Marks:25**

S.No	Reg.No	Name of the students	Marks
1	U22BC1001	Gopika P	13
2	U22BC1002	Jasmin Rose J	10
3	U22BC1003	Nishanthini R	16
4	U22BC1004	Pavithra A	14
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**Bridge course- August-2022**

**Mark statement for post-test -2022-2023**


**Time: 1hr**

**Max. Marks:25**

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1	U22BC1001	Gopika P	18
2	U22BC1002	Jasmin Rose J	16
3	U22BC1003	Nishanthini R	19
4	U22BC1004	Pavithra A	17
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11	U22BC10011	Vignesh K	15

  
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