PH 511.1

Reg. No: | | | | | | |

St Aloysius College (Autonomous)
Mangaluru
Semester I - P.G. Examination - M.Sc. Biochemistry
FEBRUARY - 2022
BIOMOLECULES

Time: 3 Hours

Max.Marks:70

I Answer any TEN of the following: (10×2=20)

1. What is saponification number of fats and oils.
2. Give classification for RNA.
3. Define Chargaff's rule.
4. Give examples of fibrous protein with structural differences
5. Write the structure of Lactose and Sucrose.
6. What are chemical differences between DNA and RNA.
7. What are reducing and non-reducing sugars? Give examples
8. What are glycoproteins? Give examples.
9. Define Peptide Bond. Write its structure.
10. What are waxes? Give examples.
11. What are types of linkages in carbohydrate and proteins?
12. What is melting temperature of DNA?

II Answer any SIX of the following: (6×5=30)

13. Describe Merrifield solid phase peptide synthesis.
14. Write a note on sickle cell hemoglobin.
15. Write a note on a) deoxy sugars b) amino sugars
16. Differentiate homo and heteropolysaccharides.
17. How can Ramachandran plot be used to predict protein structure?
18. Write a note on DNA denaturation and renaturation.
19. Explain unusual structures of DNA.
20. Explain Maxam- Gilbert method of sequencing DNA.

III Answer any TWO of the following: (2×10=20)

21. Write a note on 3D structure of proteins with an example.
22. Write short notes on a) shorthand notation of polynucleotide structure b) Phosphoramidite method for synthesis of oligonucleotide
23. Write a note on classification of lipids.
24. What are glycosaminoglycans? Discuss the types and functions.

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Semester I - P.G. Examination - M.Sc. Biochemistry
FEBRUARY - 2022
BIOCHEMICAL TECHNIQUES

Time: 3 Hours **Max.Marks:70**

I Answer any TEN of the following: **(10×2=20)**

1. What is Svedberg constant?
2. Mention any 2 advantages of lyophilization.
3. Differentiate between Native-PAGE and SDS-PAGE.
4. What are the commonly used matrices of size exclusion chromatography?
5. Enlist the applications of electron microscopy?
6. Why is solvent precipitation procedure carried out at low temperature?
7. State the Beer-Lambert's law.
8. What is FACS?
9. What are the applications of CD/ORD spectroscopy?
10. What is principle of Turbidometry?
11. Name and briefly describe the stains used for staining proteins bands in SDS-PAGE gels.
12. What is flame photometry?

II Answer any SIX of the following: **(6×5=30)**

13. Discuss the principle and instrumentation of UV-visible spectrophotometer.
14. Write a note on Ion-Exchange Chromatography.
15. Explain isotachophoresis and capillary electrophoresis.
16. Discuss the principle and applications of Infra-red spectroscopy.
17. Discuss ultrafiltration and Dialysis.
18. Discuss the principle and applications of light microscopy. Add a note on the stains used.
19. Differentiate between preparative and analytical centrifuge.
20. Elaborate on Raman spectroscopy.

III Answer any TWO of the following: **(2×10=20)**

21. Explain Agarose Gel Electrophoresis in detail.
22. Write a note on principle, instrumentation, and applications of atomic spectroscopy.
23. Discuss the principle, applications, and instrumentation of Gas Liquid Chromatography.
24. Elaborate on mass spectroscopy.

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St Aloysius College (Autonomous)
Mangaluru
Semester I - P.G. Examination - M.Sc. Biochemistry
FEBRUARY – 2022

ORGANIC AND PHYSICAL BIOCHEMISTRY

Time: 3 Hours **Max.Marks:70**

I Answer any TEN of the following: **(10×2=20)**

1. What are buffers? Give examples.
2. Write the structure and biological importance of pyrrole.
3. Define the half-life of a radioisotope.
4. Define entropy. Mention its significance.
5. What are enantiomers? Give example.
6. Mention the safety measures to be taken during the use of radioisotopes.
7. What are rearrangement reactions? Give an example.
8. What is a covalent bond?
9. What is the quenching of radioisotopes?
10. Differentiate between an open and closed system with suitable examples.
11. What is buffering capacity?
12. What is optical activity? Give an example.

II Answer any SIX of the following: **(6×5=30)**

13. Derive Henderson- Hasselbalch equation
14. What is Chirality? Write a note on RS configuration.
15. Explain the principle and working of the Scintillation counter.
16. Write a note on antioxidants.
17. State and explain the second law of thermodynamics.
18. Discuss the concept of resonance and the effect of various substitutions on a benzene ring.
19. Write a note on cyclic structures of monosaccharides.
20. Explain with suitable examples the oxidation-reduction reaction occurring in biological systems.

III Answer any TWO of the following: **(2×10=20)**

21. Give an account of the structure, bonding, and special properties of water.
22. Explain sp^n hybridization.
23. Discuss the types and mechanisms of substitution reactions.
24. Write a note on biological applications of radioisotopes.

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St Aloysius College (Autonomous)
Mangaluru
Semester I - P.G. Examination - M.Sc. Biochemistry
FEBRUARY - 2022
PHYSIOLOGY AND NUTRITION

Time: 3 Hours Max.Marks:70

I Answer any TEN of the following: (10×2=20)

1. Which one of these pituitary hormones has actions on both childbirth and lactation? How?
   a) Prolactin b) Luteinizing hormone c) Oxytocin d) Vasopressin
2. Relate creatinine clearance with glomerular filtration rate.
3. Illustrate the Bohr effect in a neatly labeled graph.
4. What is CSF? Mention its functions.
5. Name the enzymes that digest proteins in the gastrointestinal tract.
6. What are antioxidant vitamins? Give examples.
7. Define basal metabolic rate and write its normal value.
8. Write the extra dietary calorie and protein allowances for a pregnant woman.
9. What is the chemical nature of endorphins? What are their effects in the body?
10. Explain how melatonin and circadian rhythms are related.
11. Intake of rice with dal (pulses) is mutual supplementation of proteins. Justify
12. Give reason why iron deficiency anemia is common in developing countries.

II Answer any SIX of the following: (6×5=30)

13. Explain the process of gas exchange in systemic circulation.
14. Differentiate between the effects of insulin and glucagon.
15. Discuss the cardiac cycle.
16. Write a note on the salient features of Kwashiorkor and Marasmus.
17. What is the Renin-angiotensin mechanism?
18. Differentiate between microcytic, macrocytic and normocytic anemias.
19. What is bile? Explain enterohepatic circulation.

III Answer any TWO of the following: (2×10=20)

20. Describe the pathways of blood coagulation.
21. Explain the roles of various organs in acid-base homeostasis.
22. Explain the synthesis, secretion, and functions of thyroid hormones. Add a note on hypothyroidism and its influence on basal metabolic rate.
23. Describe the sources, recommended daily allowance, functions and deficiency manifestations of fat soluble vitamins.

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