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St Aloysius College (Autonomous)

Mangalore

Semester III- P.G. Examination- M.Sc. Biochemistry

December - 2022

Molecular Biology

Time: 3 hours

Max Marks: 70

I. Answer any TEN of the following;

(10x2=20)

1. What are enhancers and silencers?
2. Define N-end rule. Mention its significance.
3. Differentiate between prokaryotic and eukaryotic ribosomes.
4. What are housekeeping genes? Give examples.
5. What are Okazaki fragments?
6. What is polyadenylation?
7. What is genetic code? Give the codons for any two amino acids.
8. Mention the role of riboswitches.
9. Differentiate between mitosis and meiosis.
10. What is the significance of genomic imprinting?
11. Name any two replication inhibitors.
12. Mention the role of DNA polymerase II in DNA replication.

II. Answer any SIX of the following;

(6x5=30)

13. Describe the rolling circle model of virus DNA replication.
14. Discuss the central dogma of molecular biology
15. Explain the role of miRNA in gene silencing.
16. Explain transcription attenuation in tryptophan operon.
17. Write a note on protein splicing.
18. Describe the role of environmental factors in regulation of gene expression.
19. Give an account on the experimental studies of Nirenberg and Khorana pertaining to genetic codon.
20. Write a note on nucleosome structure.

III. Answer any TWO of the following;

(2 x10=20)

21. Give a detailed account on prokaryotic transcription.
22. Explain post translational modification of proteins.
23. Describe apoptosis. Add a note on role of p53 and Bcl-2 in apoptosis.
24. Write short notes on the following a) DNA amplification b) formation of initiation complex in translation.

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St Aloysius College (Autonomous)**Mangalore****Semester III- P.G. Examination- M.Sc. Biochemistry****December - 2022****Nitrogen Metabolism and Plant Biochemistry****Time: 3 hours****Max Marks: 70****I. Answer any TEN of the following;****(10x2=20)**

1. What is transamination? Give an example.
2. What is non-symbiotic nitrogen fixation?
3. Define N- and O- glycosylation of proteins.
4. What is meant by salvage pathway?
5. What is RUBISCO? What is its role?
6. What are secondary metabolites? Give two examples.
7. What is a) plastoquinone b) plastocyanin
8. What is CAM metabolism?
9. What is meant by seed dormancy? Name the hormone which induces dormancy in seeds.
10. What is the role of phototropins in stomatal movement?
11. Name the pathogen induced diseases in plants and their causative agents.
12. Distinguish between transpiration and guttation.

II. Answer any SIX of the following;**(6x5= 30)**

13. Explain the components and functions of nitrogenase complex.
14. Which amino acids are degraded to pyruvate? Describe the steps involved.
15. Describe the biosynthesis of proteoglycans.
16. Give an account of inborn errors of amino acid metabolism.
17. Explain the physiological effects of auxins and gibberellins.
18. Discuss the Calvin Cycle.
19. Explain the two-component regulatory systems of bacteria
20. Describe the translocation of nutrients through phloem.

III. Answer any TWO of the following;**(2x10 =20)**

21. Describe the biosynthetic pathway of tyrosine and phenylalanine.
22. Explain the ubiquitin pathway of protein degradation.
23. Discuss non-cyclic photophosphorylation.
24. Discuss the mechanisms of resistance to biotic stress in plants.

PS 515.3

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St Aloysius College (Autonomous)

Mangalore

Semester III- P.G. Examination- M.Sc. Biochemistry

December - 2022

CELLULAR BIOCHEMISTRY

Time: 3 hrs

Max Marks: 70

I. Answer any TEN of the following;

(10x2=20)

1. What are caveolae? Mention their significance.
2. Define ionophores. Give any two examples.
3. What is phospholamban? Give its relevance.
4. What are peroxisomes? Mention any two roles of peroxisomes.
5. Briefly explain the importance of fibronectin.
6. What is bacterial chemotaxis?
7. What are hormone responsive elements (HRE)?
8. What is dystrophin? State its clinical relevance.
9. Give any two examples for second messengers.
10. Briefly explain the role of sterols in the membrane.
11. Distinguish between occluding and adhering cellular junctions.
12. Briefly explain Daniell-Davson model of membrane.

II. Answer any SIX of the following;

(6x5= 30)

13. What is Patch clamp technique? Give its applications
14. Why is Na⁺ glucose transporter system called as secondary active transport system?
15. Briefly discuss the roles of different adhesion molecules.
16. Discuss the molecular organization of contractile systems.
17. What is the mechanism of action of nitric oxide? Give its physiological relevance.
18. What is rhodopsin? Explain the vision cycle.
19. What is DAG? What is the role of DAG in signaling?
20. Discuss the structural organization and function of nucleus.

III. Answer any TWO of the following;

(2x10 = 20)

21. Discuss neurotransmission and its regulation.
22. Explain the mechanisms of intracellular transport.
23. Discuss the different classes of extracellular and intracellular receptors involved in the signal transduction pathways.
24. What is supramolecular organization of biomembranes? Explain the physicochemical properties of biological membranes.
