Nayagarh Autonomous college, Nayagarh

CC-VIII: Molecular Genetics

Unit-1

1.Objective questions [1 marks]

1. **_____ proposed the transforming principle?**
2. **The transforming principle was identified by _____.**
3. **The 3D structure of DNA was analysed by _____ method?**
4. **Single stranded DNA is found in _____.**
5. **Double stranded RNA is found in _____.**
6. **In the same strand of DNA the nucleotides are joined together by _____ bond.**
7. **Both the strand of DNA are joined together by _____ bond.**
8. **Both the strands of DNA are _____, _____ to each other.**
9. **_____ is also called as adoptor molecule.**
10. **_____ is also called as soluble RNA.**
11. **_____ is the smallest RNA.**
12. **The nucleotide that is exclusive to DNA is _____.**
13. **_____ is the missing nucleotide in RNA.**
14. **_____ is the missing nucleotide in DNA.**
15. **In RNA _____ is present instead of thymine.**
16. **In RNA adenine is complementary to _____.**
17. **The radioactive isotope used in chase and Hershey experiment was _____ and _____.**
18. **Clover leaf model of t-RNA was given by _____.**
19. **_____ is the most abundant RNA.**
20. **_____ is the most stable RNA?**
21. **Conversion of double stranded DNA into single stranded form on heating called _____.**
22. **Circular DNA is found in _____.**
23. **Chase and Hersky experiment is based on _____.**
24. **The bacteria used by Grilfith was _____.**
25. **_____ is the master molecule of life.**
26. **_____ is the blue print of life.**
27. **_____ carries the genetic message from DNA to ribosome during proper synthesis.**

28. **Formation of RNA from DNA is called _____.**
29. **RNA also act as genetic material was proved from _____ experiment.**
30. **In DNA Adenine is complementary to _____ where as Cytosine is complementary to _____.**
31. **Acidic properly of nucleic acid is due to presence of _____.**
32. **Phosphoric esters of nucleoside is called as _____.**
33. **In a nucleotide the bond present between base and sugar is _____.**
34. **In a Nucleotide the bond present between Sugar and Phosphate is _____.**

35.Poly nucleotide chain is called _____.

2.Answer within 1 to 2 statements [1.5 marks]

1. **What is the difference between Ribose and Deoxy Ribose sugar?**
2. **What is denaturation of DNA?**
3. **What is renaturation of RNA?**
4. **What is a deoxy Ribo-nucleotide?**
5. **Clover leaf model and t-RNA is based on which RNA fromwhich organism and consist of how many nucleotide?**
6. **What is the function of Anticodon site?**
7. **What is the function of TYC loop?**
8. **What is the function of DHO loop?**
9. **What is the function of Amino Acid binding site of t-RNA?**
10. **Where the Glycosidic bond is present in a Pyrine nucleotide with particular number?**

3.Answer within 75 words [2 marks]

1. **Difference between Denaturation and Renaturation?**
2. **What is cot curve?**
3. **Write a brief note on Fraenkel-Conrat experiment?**
4. **What are the function of RNA?**
5. **Write a short note on Nucleotide?**
6. **Write a brief note on Clover leaf model of t-RNA?**
7. **What are the basic difference between the organization of prokaryotic and Eukaryotic DNA?**

4.Answer within 500 words (6×4)

1. **Describe the molecular structure of Double helical DNA?**
2. **Describe the organization of mitochondria and chloroplast DNA?**
3. **Prove the DNA as the genetic material by the help of evidences present in your syllabus?**

Unit-2

1.OBJECTIVE QUESTIONS [1 MARKS]

1. **DNA replication is the _____ function of DNA.**
2. **DNA Replication is _____ and _____.**
3. **Replication starts from a definite region called _____.**
4. **Unwinding of DNA double helix is brought about by the enzyme _____.**
5. **Unwinding and rewinding of DNA is brought about by the enzyme _____.**
6. **_____ is referred to as Kombery enzyme.**
7. **Primers are the short segment of _____ and lead down by the enzyme _____.**
8. **Primers are removed by the _____ activity of enzyme _____.**
9. **Bits of DNA fragments are joined by the enzyme _____.**
10. **Replication occur from _____ to _____ direction.**
11. **Newly discontinuously synthesized strand is called _____ strand.**
12. **New strand of DNA is synthesized by the enzyme _____.**
13. **A strand which can synthesize it's own complementary strand is called _____ strand.**
14. $DNA \xrightarrow{Transcription} RNA \xrightarrow{Translation} PROTEIN$ **is called _____.**
15. **The number of punctuation codon is _____.**
16. **_____ and _____ act as initiating codon.**
17. **_____, _____ and _____ are the terminating codon.**
18. **The third position of a codon is called _____.**
19. **Degenerachy is attributed to _____ number of codon.**
20. **Gene expression refers to _____.**
21. **_____ is refered to as Gene product.**
22. **Eukaryotic Gene is called _____ gene.**
23. **The coding sequence present in eukaryotic gene is called _____.**
24. **The non-coding sequence is called _____.**
25. **RNA produced from Eukaryotic DNA is called _____.**
26. **RNA containing exon and intron is called _____.**

27._____ refers to Cap.

28.Removal of intron and joining of exon is called as _____.

29. Poly(A) tail is added to _____ end of m-RNA.

2.Answer in 1 to 2 sentences [1.5 marks]

1. What is central dogma?
2. What is genetic code?
3. What is degeneracy of code?
4. What is wobble hypothesis?
5. What is the method by which semi-conservative replication was proved and what are the isotope used?
6. What is semi conservative mode of DNA replication?
7. What is punctuation codon?
8. What is terminating or nonsense codon?
9. What is leading strand and lagging strand?
10. What are Okazaki fragment?
11. What is split gene?
12. What is hnRNA?
13. What are exon and intron?
14. What are cap and tail? What is their function?
15. What are “Snurp”?

3.Answer in 75 words [2 marks]

1. Make a brief note on rolling circle mechanism of Replication?
2. Write some important characters of Genetic code?
3. Write a note on Central Dogma?
4. What is Adoptor hypothesis?
5. What are the enzymes involved in DNA replication and what is their function in Prokaryotic?
6. How Eukaryotic DNA replication differ from Prokaryotic?
7. Write a note on Spliceosome?
8. Write a note on Primosome?
9. Write a brief note on Heiselson and Stahl experiment?
10. Write a note on Ribozymes?
11. Write short note on RNA editing?
12. What is exon saffling?
13. Write a short note on theta (θ) mode of replication?
14. Briefly describe the replication of end of Linear chromosome?

4.Answer in 500 words [6 marks]

1. **Describe the mechanism of DNA Replication?**
2. **Describe the method of RNA processing or post transcriptional modification of RNA.**
3. **Describe the mechanism OF Group I and Group II intron splicing.**

Unit-3

1) Fill in the blanks with one words(1×8)

(i) _____ subunits of RNA polymerase is solely required for initiation of transcription.

(ii)The precess of copying a gene's DNA sequence into a sequence of RNA is called_____.

(iii) The sequence of bases in DNA is ATTCGATG,then the sequence of bases in the transcript_____.

(iv) The first transcription factor in eukaryotes to bind to the TATA box is _____.

(V)Pribnow box is the -10 box is bacterial promoter region having consensus sequence____.

(Vi) The operator gene of Lac operon is turned on when lactose molecules bind to_____.

(Vii) The synthesis of b- galactosidase encoded by _____gene of lactose operon.

(Viii) Lac operon and tryptophan opern are the models of gene expression in_____.

(2)Short answer type: Answer the questions in 2-3 sentences (1.5×8)

(i)Write a brief note on transcription factor?

(ii) Write subunits of DNA dependent RNA polymerase?

(iii) What is template and coding strand?

(iv)What is central dogma?

(V) What is "House-keeping genes"?

(Vi) Name the genes of repressible system of Operon?

(Vii)What is heterogeneous nuclear RNA?

(Viii) What is Cistron,Recon and muton?

(3)Short answer type : Answer the questions within 75 words (2×8)

(i)Describe posetive regulation of lactose operon ?

(ii)Describe posetive regulation of lactose operon ?

(iii)Describe Rho independent termination in prokaryotes?

(iv) What do you understand by "Operon model" and give details of inducible systems?

(v)What is 5'- capping in RNA processing of eukaryotes ?

(Vi)Write a brief note on heat shock protein?

(Vii) Describe role of SiRNA in gene silencing?

(Viii)What is Splicisome mediate RNA processing ?

(4)Long answer type:Answer the questions within 500 words(6×4)

(i)What is transcription?Describe it's mechanism in prokaryotes?

(ii)Narrate consisely gene regulation at transcriptional level in eukaryotes ?

(iii) Give an illustrative account of regulation of lactose metabolism through lac operon in E.coli ?

(iv) Give a brief account of gene silencing in eukaryotes?

(V) What is regulation of gene expression? A brief account of Operon model for regulation of gene activity?

Unit-4

(1) Fill in the blanks with one words (1×8)

(i) Termination codons are UAA,____&_____.

(ii) Initiation codon in prokaryotes is _____.

(iii) During elongation in translation, ____ enzyme which catalyses the synthesis of peptide bond.

(iv) _____inhibitors inhibits peptidyl transferase activity in eukaryotes?

(V) Aminoacyl synthetase enzyme takes part in__.

(Vi) The adjacent amino acid are joined together by _____bond to form long polypeptide chain.

(Vii) Release factor 2 recognise _____stop codon in prokaryotes for termination.

(Viii) _____ site of t-RNA molecule make hydrogen bonds to mRNA molecule.

(2)Short answer type: Answer the questions in 2-3 sentences(1.5×8)

(i) Give a brief note on Clover leaf model of tRNA structure?

(ii)Name two inhibitors which inhibit translation

Process of prokaryotic cell?

(iii) what is translocation process?

(iv) what is Shine-Dalgarno sequence?

(V) Give a brief note on three t-RNA binding sites of ribosome?

(Vi) What is translation?

(Vii)What is polycistronic and monocistronic m-RNA?

(Viii) What is Chaperon?

(3) Short Answer type:Answer the questions within 75 words (2×8)

(i) Give a brief note on Ribosome assembly?

(ii) Describe steps of initiation of translation in prokaryotes?

(iii) What is proteolytic degradation?

(iv) Discuss about activation of amino acid in translation?

(V) What is role of covalent modification in post translational modification?

(Vi)Give a brief note on fidelity of translation?

(Vii)Describe the process of dissociation of ribosome ?

(Viii) Describe the process of dissociation of ribosome?

(4)Long answer type: Answer the questions within 500 words(6×4)

(i) Give an account of process of translation in prokaryotes?

(ii) Discuss post- translational modification of proteins?

(iii) Describe translation process in eukaryotes?

(iv) What do you mean by fidelity of translation?Describe it with reference to translation mechanism?

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