

SEAT No. _____

C82J

No. of Printed Pages:02

SARDAR PATEL UNIVERSITY

T.Y.B.Sc EXAMINATION, Vth Semester

Saturday, 2nd January, 2021, 2.00 to 4.00p.m

BIOTECHNOLOGY: US03CBIT21 [Fundamentals of Biotechnology]

NOTE- Figures in the right indicate full marks.

Maximum Marks-70

Q.1. Multiple Choice Questions (10 marks- One Mark for Each MCQ) [10]

1. What type of bond connects nitrogenous bases with sugar?

- a. Phosphodiester b. Hydrogen. c. Ionic. d. glycosidic.

2. Which of the following is a key component of a DNA nucleoside?

- a. Nitrogenous base b. Deoxyribose sugar c. Phosphate group d. Both a and b.

3. In terms of DNA and RNA structure, a nucleotide is a

- a. a heterocyclic base.
b. a sugar molecule covalently bonded to a heterocyclic.
c. a sugar molecule bonded to phosphate group/s and a heterocyclic base
d. a heterocyclic base bonded to phosphate group/s

4. The lacZ gene of pUC18 vector encodes for

- a. antibiotic resistance b. β -galactosidase enzyme
c. β -lactamase enzyme d. β -galactoside transferase enzyme.

5. What is incorrect about plasmid?

- a. Helps in reproduction b. Contains stress resistant genes
c. Serves as the transformation vehicle d. They are the genetic material of the bacteria

6. Name the RNA molecule which takes part in the formation of the ribosome?

- a. mRNA b. tRNA c. rRNA d. gRNA

7. What is the amino acid binding sequence in tRNA?

- a. AUG b. GUG c. CCA d. T ψ C

8. Which of the following is not a function of reverse transcriptase?

- a. RNA dependent DNA polymerase c. RNase H
b. DNA dependent DNA polymerase d. Exonuclease

9. Which of the following occurs in meiosis but not in mitosis?

- a. Attachment of spindle fibers to kinetochore
b. Replication of DNA prior to start of cell division
c. Separation of sister chromatids at anaphase
d. Pairing of homologous chromosomes at metaphase plate

10. At which cell cycle checkpoint, cell cycle is halted if cell's DNA is damaged?

- a) G₁ - S b) S - G₂ c) G₂ - M d) G₀ - G₁

[1]

[P.T.O.]

Q.2. Fill in the Blanks and True –False (01 Mark each)

[08]

1. When DNA is in bound form, there is decrease in absorption of UV light, known as -----
2. Because DNA is a highly charged polyanion, its stability to heat denaturation decrease with ---
---- of salt ions.
3. ----- scientists who discovered the plasmid pBR322.
4. Replication of plasmid DNA other than initiation is controlled by-----
5. The ratio of absorption at 260nm to absorption at 280nm is commonly used to assess.....
6. RNA genomes were first discovered in _____ viruses.
7. The spindle apparatus is formed during the _____ phase of mitosis.
8. Cdk2/cyclin E functions in _____

Q.3. Short Answer Question (any 10 question X 2 marks each)

[20]

1. Discuss any four physiochemical properties of DNA.
2. Enlist four assumptions of Chargaff's rule.
3. Discuss Harshey and Chase experiment with its finding.
4. Define basic feature of plasmid.
5. Draw a neat map of PUC8 Vector with its genes.
6. Enlist four important feature of a plasmid to be a vector.
7. Describe the structure of tRNA with its function.
8. Discuss with function about microRNA.
9. Describe the four properties of genetic code.
10. Discuss various stages of meiosis I division with diagram.
11. Discuss the regulation of cell cycle progression from S to G phase.
12. Discuss various stages of mitotic division with diagram.

Q.4. Long Answer Question (attempt any 4 X 08 marks each)

[32]

1. Discuss in detail about the difference between A, B and Z form of DNA.
2. Describe the experiment of Avery, McCleod and MaCarty with its significance.
3. Describe the important feature of Ti plasmid with its map.
4. Discuss with a neat map about plant chloroplast genome.
5. Describe the replication of retrovirus with feature of its enzymes.
6. Discuss the principle and procedure for isolation of RNA.
7. Discuss the intrinsic apoptosis pathway steps for programmed cell death.
8. Describe the basics of cell cycle regulation with its components