

2015

(5th Semester)

BIOTECHNOLOGY

Paper No. : BT-V

(**Molecular Biology**)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(Marks : 35)

*The figures in the margin indicate full marks
for the questions*

1. Describe the genome organization in prokaryotes. 7

Or

Describe the repetitive DNA content of eukaryotic genome. 7

2. Explain the mechanism of replication in prokaryotes. 7

Or

Explain the experimental evidence to prove semiconservative replication of DNA. 7

G16/160a

(Turn Over)

3. Describe the mechanism of transcription of rRNA and its post-transcriptional modification. $3\frac{1}{2}+3\frac{1}{2}=7$

Or

Describe the mechanism of splicing of an mRNA transcript. $2+5=7$

4. Describe the steps involved in protein metabolism. 7

Or

Elucidate the statement : "Post-translational modification of eukaryotic proteins begins in the Endoplasmic Reticulum." 7

5. Describe the types and causes of mutation. 7

Or

Describe in brief repair of DNA damage. 7

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(5th Semester)

BIOTECHNOLOGY

Paper No. : BT-V

(Molecular Biology)

(PART : A—OBJECTIVE)

(Marks : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 5)

Put a tick (✓) mark against the correct answer in the brackets provided : 1×5=5

1. Which of the following is not a characteristic of DNA-dependent DNA polymerases?

- (a) The newly synthesized polynucleotide contains deoxyribonucleotide subunits ()
- (b) Polymerization is always in the 5' → 3' direction ()
- (c) Bacterial DNA polymerase III possesses 5' → 3' exonuclease activity ()
- (d) Some DNA polymerases possess proofreading activity ()

2. Some variation in C-value may occur within the species because of

- (a) repetitive DNA ()
- (b) mitochondrial DNA ()
- (c) chloroplast DNA ()
- (d) None of the above ()

3. The recognition sequence to which RNA polymerase binds at the initiation of transcription is found

- (a) downstream of the promoter target sequence ()
- (b) upstream of the gene to be transcribed ()
- (c) within the first intron ()
- (d) downstream of the transcription bubble ()

4. Which of the following events marks the final step of the initiation phase of translation?

(a) A complete ribosome is formed and positioned over the initiation codon ()

(b) Initiation factors attach to the initiation codon ()

(c) The aminoacyl (A) site is occupied by the initiator tRNA ()

(d) The cap binding complex assembles around the 5' cap of the mRNA ()

5. Loss of a purine base (A or G) to form an apurinic site (AP site) is called

(a) tautomerism ()

(b) depurination ()

(c) deamination ()

(d) strand mispairing ()

SECTION—B

(Marks : 15)

Write short notes on the following : 3×5=15

1. Mitochondrial genome

2. DNA polymerase (of eukaryotic DNA replication)

the initiation phase of replication?

(a) A complex ribosome is formed and positioned over the initiation codon.

(b) Initiation factors attach to the initiation codon.

(c) The aminoacyl-tRNA site is occupied by the initiator tRNA.

(d) The cap binding complex assembles around the 5' cap of the mRNA.

3. Conversion of a purine base (A or G) to form an apurinic site (AP site) is called

(a) tautomerism

(b) depurination

(c) deamination

(d) strand breakage

3. Function of RNA polymerases

Write short notes on the following :

1. Mitochondrial genome

4. Wobble hypothesis

30 Marks

5th Semester

(5th Semester)

BIO-TECHNOLOGY

Paper No. : BT-V

(Molecular Biology)

(PART - A - OBJECTIVE)

(Marks : 20)

The figures in the margin indicate full marks for the questions

SECTION - A

(Marks : 5)

Put a tick (✓) mark against the correct answer in the brackets provided. (1*5=5)

1. Which of the following is not a characteristic of DNA-dependent DNA polymerase?

- (a) The newly synthesized polynucleotide contains deoxyribonucleotide subunits. ()
- (b) Polymerisation is always in the 5' → 3' direction. ()
- (c) Bacterial DNA polymerase III possesses 5' → 3' exonuclease activity. ()
- (d) Some DNA polymerases possess proofreading activity. () ***

5. Ames test

- (a) repetitive DNA
- (b) mitochondrial DNA
- (c) chloroplast DNA
- (d) None of the above

3. The recognition sequence to which RNA polymerase binds at the initiation of transcription is found

- (a) downstream of the promoter sequence
 - (b) upstream of the gene to be transcribed
 - (c) within the first intron
 - (d) downstream of the transcription bubble
- ***