

B.Sc. BOTANY
SIXTH SEMESTER [SPECIAL REPEAT]
MOLECULAR BIOLOGY
BSB-601
[USE OMR SHEET FOR OBJECTIVE PART]

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

(Objective)

Choose the correct answer from the following:

1 × 20 = 20

- Which of the following is an example of Homology and similarity tool?
a. BLAST
b. RasMol
c. EMBOSS
d. PROSPECT
- Which of the following sequences in a gene is transcribed but not translated?
a. Exon
b. Intron
c. Promoter
d. Terminator
- Which of the following scientists created the first Bioinformatics database?
a. J.D. Watson
b. Richard Durbin
c. Margaret Dayhoff
d. Michael J. Dunn
- Which of the following are not the applications of bioinformatics?
a. Drug designing
b. Data storage and management
c. Understand the relationship between organism
d. None of the above
- Alignment method suitable for aligning closely related sequence is:
a. Multiple sequence alignment
b. Pairwise alignment
c. Global alignment
d. Local alignment
- Lac operon is an example of:
a. Only positive regulation
b. Both positive and negative regulation
c. Only negative regulation
d. Sometimes positive sometimes negative
- A gene's expression can be regulated by:
a. Transcription factors alone
b. The rate of mRNA degradation
c. The presence of enhancers and silencers
d. All of the above
- Which of these acts as an inducer of the lac operon?
a. Allolactose
b. Lactose
c. Galactose
d. Glucose
- ENTREZ is:
a. A form-based resource to retrieve Medline references related to molecular biology
b. A form-based resource to retrieve DNA or protein sequences
c. Prepared only by the staff of the National Center for Biotechnology Information
d. A straightforward way to access the sequence database

10. Which of the following is not a part of a genes' structure?
 - a. Promoter
 - b. Operator
 - c. Exon
 - d. Intron
11. How many effective codons are there for the synthesis of 20 amino acids?
 - a. 61
 - b. 64
 - c. 32
 - d. 41
12. The following genetic code codes for the amino acid proline?
 - a. AUG
 - b. CCC
 - c. UGA
 - d. UAC
13. Euploidy is a chromosomal variation in:
 - a. Size
 - b. Number
 - c. Structure
 - d. Position
14. Which of the following chemical induce polyploidy in plants?
 - a. Formaline
 - b. Colchicine
 - c. Safranin
 - d. 5 bromo uracil
15. Which base is generated due to the deamination of adenine?
 - a. Guanine
 - b. Hypoxanthene
 - c. Cytosine
 - d. Uracil
16. Mutagens are physical oragents.
 - a. Chemical
 - b. Mechanical
 - c. Exogenous
 - d. Endogenous
17. Which three codons can be responsible for translation termination?
 - a. UAG, UAA, UGA
 - b. UAA; UCA, UGG
 - c. UAC, UGA, UAA
 - d. UGG, UAC, UCA
18. Farmers often practice polyploidy as.....
 - a. It makes the plants more durable
 - b. They take longer time to undergo meiosis
 - c. It increases complexity and there is a hope of new species
 - d. It produces larger plant parts and products
19. What is the substitution of a purine base with a pyrimidine base known as?
 - a. Transition
 - b. Deletion
 - c. Addition
 - d. Transversion
20. What is the chromosome number of Triticum aestivum?
 - a. $6n=42$
 - b. $2n=24$
 - c. $4n=48$
 - d. $3n=42$

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

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|---|-------------|
| 1. Draw the codon table with the names of respective amino acids against each codon. | 10 |
| 2. Describe the structure and regulation of lac operon in the absent of lactose with a suitable diagram. | 10 |
| 3. Write short notes on the following: | 2.5+2.5+2.5 |
| a) Global Alignment | +2.5=10 |
| b) Local Alignment | |
| c) Pairwise Alignment | |
| d) Multiple Sequence Alignment | |
| 4. Differentiate between the prokaryotic and eukaryotic gene structure with suitable diagrams. | 5+5=10 |
| 5. What is ploidy? Discuss polyploidy in <i>Triticum aestivum</i> with proper illustrations. | 2+8=10 |
| 6. Discuss the properties of genetic code. | 10 |
| 7. Define BLAST. Describe briefly the process involved in BLAST analysis and how to interpret the BLAST output. | 2+4+4=10 |
| 8. What is point mutation? Describe base analogue and deamination with proper illustrations. | 3+7=10 |

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