FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2017
(CUCBCSS—UG)
Botany
BOT 5B 08—GENERAL AND BIOINFORMATICS, INTRODUCTORY BIOTECHNOLOGY
AND MOLECULAR BIOLOGY
Time : Three Hours
Maximum : 80 Marks

Part A

Answer all questions.

I. Choose the correct answer:

1. A name or number used to identify a storage location:
   (a) Byte.  
   (b) Carry bit.  
   (c) A file.  
   (d) An address.

2. A phylogenetic analysis tool:
   (a) FASTA.  
   (b) SPDBV.  
   (c) MEGA.  
   (d) GOLD.

3. In tissue culture medium, the embryos formed is due to:
   (a) Cellular totipotency.  
   (b) Organogenesis.  
   (c) Double fertilization.  
   (d) Test tube culture.

4. What is/are the benefit(s) of micropropagation or clonal propagation?
   (a) Rapid multiplication of superior clones.
   (b) Multiplication of disease free plants.
   (c) Multiplication of sexually derived sterile hybrids.
   (d) All of the above.

5. The transgenic crop ‘Golden rice’ has the potential to solve:
   (a) Night blindness.  
   (b) Colour blindness.  
   (c) Short sightedness.  
   (d) Long sightedness.

Turn over
II. Name the following:
6 Bioinformatics Tool used to compare predicted gene against nucleotide sequences.
7 Who is the founder of Facebook?
8 What are Contigs?
9 Which site of tRNA molecule hydrogen bonds to an mRNA molecule?
10 Name the enzyme used to join bits of DNA.

(10 × 1 = 10 marks)

Part B
Answer all questions.

11 Calculate the score of the DNA sequence alignment shown below with +1 for match, –1 for mismatch and –2 for gap:
A T G T T A T G T A
A T G C A T T A

12 Differentiate between rooted and unrooted phylogenetic trees.
13 "The Agrobacterium is considered as Natural Genetic engineer of plants." Comment.
14 Explain the liposome mediated gene transfer in plant cells.
15 What is the significance of sterilization of the medium and explants in tissue culture?
16 Explain Hybridoma Technology.
17 Distinguish between dedifferentiation and redifferentiation.
18 Define the terms gene and allele.
19 How does DNA fulfill the requirements of a genetic material?
20 Mention any four goals of Human Genome Project.

(10 × 2 = 20 marks)

Part C
Answer any six questions.

21 Explain the applications of Internet.
22 Give an account of biological databases.
23 Write a short note on restriction enzymes.
24 What is DNA fingerprinting? Explain the procedure and applications.
25 What is somatic embryogenesis? Describe the production of somatic embryo and discuss its advantages and disadvantages.

26 What are haploids? How do you produce through tissue culture technique? Mention their applications.

27 What are the structural features of tRNA?

28 Describe the consequences of a base substitution mutation with regards to sickle cell anaemia. 

\[(6 \times 5 = 30\text{ marks})\]

**Part D**

*Answer any two questions.*

29 Write a note on BLAST, explaining the basic steps, utility and variants.

30 Describe in detail the method of PCR technique and its applications.

31 Explain the process of Translation in prokaryotes. State any four differences from eukaryotic translation.

\[(2 \times 10 = 20\text{ marks})\]