B.Sc. (Honours) Examination, 2019
Semester-VI
Botany
Course: BBC-62 (Core)
(Molecular Biology & Genetic Engineering)

Time: Three Hours **Full marks:40**

Questions are of value as indicated in the margin

1. Answer ***any eight*** of the following: 1×8=8

i) Name one enzyme used besides Taq DNA polymerase in PCR.
ii) What is meant by plasmid incompatibility?
iii) State the function of 5'-splice site in pre-mRNA splicing.
iv) State the function of SI nuclease.
v) What is SNP?
vi) What is a GenBank?
vii) Name two rep-initiator proteins required for plasmid replication.
viii) Which subunit of RNA polymerase contains catalytic activity?
ix) State the specific function performed by reverse transcriptase.
x) What is the recognition sequence for*BamHI*?
xi) Point out the function of UvrB in nucleotide excision repair of DNA in *E. coli*
xii) What is wobble hypothesis?

Group-A (Molecular Biology)
Answer ***any two*** questions

2. What is a gene promoter? Why is sequence within the promoter highly conserved? What are the three major functions of sigma factor? 2+3+3=8
3. Why is it necessary to sequence the entire human genome? What is its size? What percentage of human genome is identical between any two individuals? 6+1+1=8
4. What is meant by inducible operon? Cite one example in which induction of promoter is cAMP dependent. What are the common strategies to achieve constitutive expression of β-galactosidase within the *lac* operon in *E. coli?* 2+1+5=8

Group-B (Genetic Engineering)
Answer ***any two*** questions

5. What is thedifference between reporter and marker gene? Describe the significance of marker gene in cloning a gene. 4+4=8
6. Distinguish between cDNA and genomic DNA library. Why do you clone cDNA to express a eukaryotic protein in bacteria?Mention two goals of constructing a cDNA library? 3+3+2=8
7. Define cloning. Briefly explain four different strategies to confirm the presence of insert within the vector. 2+6 =8

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