Navrachana University
School of Liberal studies and Education
B.Sc.Program
End-Semester Examination November 2017
TY BSc Semester V
Biotechnology (BC302)

Date:22/11/2017
Time: 1:00 – 3:00 PM

Marks: 40

Instructions:
→ *All the Questions are Compulsory*
→ *Please read the questions carefully and answer accordingly*
→ *Draw a neat and labeled diagram wherever necessary*

Q1.Multiple Choice Questions:

(1× 6= 6M)

1. A recombinant DNA molecule is produced by
a) joining of two DNA fragments   b) joining of two or more DNA fragments
c) both a and b
d) joining of two or more DNA fragments originating from different organisms

2. What is the normal role of restriction endonucleases in bacterial cells?
a) To degrade the bacterial chromosome into small pieces during replication
b) To degrade invading phage DNA
c) To produce RNA primers for replication
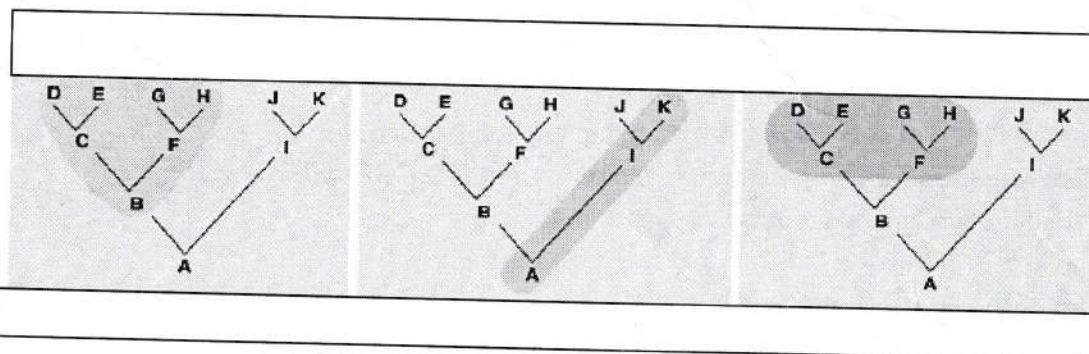d) All of the above

3. DNA finger printing relies on
a) Difference in patterns of genes between individuals
b) Difference in order of genes between individuals
c) Difference in junk DNA patterns between individuals
d) All of these

4. Among the following diagrams which taxon represented by the shaded region represents a monophyletic group?

Taxon A   Taxon B   Taxon C

a) Taxon A and B   b) Taxon B and C   c) Taxon C only   d) Taxon A only

5. Some students still have difficulties to discriminate between the term homology (=shared ancestry) and significant similarity. Which of the following statements is/are correct:

P) All complex sequences that show significant similarity in a pair wise sequence comparison are homologous.

Q) All homologous sequences show significant similarity in a pair wise sequence comparison.

R) Both of the above statements are correct.

a) Only P   b) Only R   c) Only Q   d) Neither of them.

6. Phagemid vectors are

a) combination of plasmid and phage λ   b) combination of phages and cosmid

c) phages carrying properties of plasmids   d) all of the above

Q2. Fill in the blanks: (1× 4= 4 M)

1. Isolating genes often begins by purifying the mRNA for a protein, and then converting it from from RNA to DNA using an enzyme called _____.

2. The resulting DNA molecule from above mentioned experiment (1); is called _____, and can be used as a probe to find the original gene in a genomic library.

3. A research biologist assembles a list of all the proteins produced by a certain spider found in the Amazon. He uses this list to study the interactions of certain proteins of interest. This scientist is using an approach called _____.

4. In bioinformatics, the identification of drugs through genomic study is called as _____.

Q3. Diagrametically Illustrate the process of lysogeny and lytic cycle of virus.   (2x1 =2 M)

Q4. Answer the following questions in short.   (1× 6=6 M)

1. How will you classify the EcoRI based on nomenclature of restriction enzyme ?

2. Differentiate between knockout and knockin.

3. In Blotting technique; why is it first necessary to transfer the DNA fragments from the agarose gel to nitrocellulose ?

4. At a crimescene the police takes DNA samples for DNA profiling using STR (short tandem repeats) analysis. Days later, a person is arrested for the crime based solely on STR analysis of the DNA. Briefly explain why this would be silly for the police to do.

5. What is pyrolysis? State its impotance.

6. *"Biofuels can not replace fossil fuels without having impact on food supplies"* Justify

Q5. Answer the following questions in brief (any 4)   (2 × 4= 8M)

1. What is 'Golden Rice'? In what way it is different from the normal rice?

2. *"Junk DNA is not junk DNA"* (True/False). Justify

3. Write down the differences between microsatellite and minisatellite.

4. *"Biopesticides are usually inherently less toxic than conventional pesticides"*. Justify

5. Differentiate between any two types of biopesticides.

Q6. Answer the following questions in detail (any 4)   (3 ×4= 12M)

1. What is a blot ? List out various blotting techniques and explain any one of them in detail.

2. What is blue/white selection ? Why does this technique acts as useful tool in rDNA techonology ?