

9. Write short notes on any *two* :

2×5

- (a) M13 phage vector.
  - (b) Subtractive hybridization.
  - (c) Antisense RNA technology.
  - (d) Importance of methylation of DNA.
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5. Write short notes : 2×2 $\frac{1}{2}$
- (a) HAC.
- (b) Non-radioactive labelling.

**Group — C**

Answer any *two* questions from the following : 2×10.

6. In an experiment, how to determine up regulation and down regulation of expression of genes ? 5+5
7. What do you mean by horizontal and vertical gene transfer ? Describe briefly the *Agrobacterium* mediated gene transfer using *in vitro* explants in plant. How would you confirm the integration of foreign gene into host by using molecular approach ? 1+5+4
8. Describe the structure of a hammerhead ribozyme. How autocatalytic cleavage occurs in such a ribozyme ? What is the current status in gene therapy research ? 4+3+3

- (d) What is a "Knock-in" ?
- (e) Name two marker genes, each of plant and animal, used for transformation.
- (f) Can M13 be used as phagemid ?
- (g) Mention the role of IPTG and X-GAL in gene cloning.
- (h) Distinguish between primer and probe.

**Group — B**

Answer any *two* questions from the following : 2×5

- 2. Draw the physical map of pBR322 and describe in detail.  
5
- 3. "RNA as catalysts have evolutionary significance" — elaborate. What is phage display ?  
4+1
- 4. Briefly describe the calcium phosphate method of DNA transfection. What is the importance of nick translation ?  
3+2

**2015**

**M.Sc.**

**2nd Semester Examination**

**BIOTECHNOLOGY**

**PAPER—BIT-204**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Group — A**

**1. Answer any five questions from the following : 5×2**

- (a) What is “hairpin” ribozyme? State its use.
- (b) What are EST-tagged probes?
- (c) State the role of Polynucleotide Kinase.

*(Turn Over)*