(83 & A-84) Seat NO: _____ No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY

M. Sc. (Integrated) Biotechnology – Fifth Semester Examination

Wednesday, 19th October, 2016

02:00 p.m. to 05:00 p.m.

PS05CIGB02: Recombinant DNA Technology

Note: 1) Figures to the right indicate marks

2) Draw diagram wherever necessary

Total marks: 70

Q – 1 Choose the most appropriate alternative for the following: **(08)**

1. Who discovered restriction enzymes?
   a) Nathan, Arber & Smith in 1970
   b) Watson, Crick & Wilkins in 1970
   c) Paul Berg in 1975
   d) Boyer and Cohen in 1975

2. In measurement of growth of culture, O.D. 1.00 corresponds _____ cells/ml.
   a) $2x10^9$
   b) $8x10^9$
   c) $0.8x10^9$
   d) $0.2x10^9$

3. PCR is used to
   a) Detect HIV in suspected AIDS patients
   b) Detect mutation in the genes in suspected cancer patients
   c) Create mutation in a short DNA fragment
   d) All of these

4. All of the following are thermostable polymerases except
   a) Taq polymerase
   b) Vent polymerase
   c) Pfu polymerase
   d) DNA polymerase III

5. _____ technique involves use of both restriction digestion and PCR.
   a) RFLP
   b) DGGE
   c) RAPD
   d) AFLP

6. The principle of Sanger's method relies on
   a) Use of chemicals for base specific cleavage
   b) Use of dNTPs for chain termination
   c) Use of ddNTPs for chain termination
   d) None of these

7. Which of the following is known as "Flavr savr"?
   a) Specific variety of pesticide
   b) Toxic insecticidal protein
   c) Transgenic chicken
   d) Transgenic tomato

8. Who invented scorpion probe?
   a) Dr. David Whitcombe
   b) Kary Mullis
   c) Hugo de Vries
   d) Watson and Crick

[P.T.O.]

Q – 2 Attempt ANY SEVEN from the following: **(14)**

1. Write the nomenclature of plasmid cloning vectors.
2. Give diagrammatic representation of gene cloning steps.
3. Write the principle of PCR.
4. List advantages of PCR.
5. What are limitations of Q PCR?
6. What is the difference between dominant and codominant marker system? Group various finger printing techniques into dominant and co dominant markers.
7. Narrate applications of DGGE.
8. What is metabolic engineering?
9. What are the problems of gene therapy?

Q – 3 (a) Enlist manipulative enzymes and explain polymerase and nuclease in detail. **(06)**

(b) Explain restriction modification system using *E.coli.*-λphage system. **(06)**

OR

(b) Enlist the properties of ideal host and vector. **(06)**

Q – 4 (a) Give an account on RT PCR. **(06)**

(b) Discuss the factors affecting PCR in detail. **(06)**

OR

(b) Describe the mechanism of scorpion probe and TaqMan probe. **(06)**

Q – 5 (a) Give comparative account on RFLP and AFLP. **(06)**

(b) Explain chemical degradation method of DNA sequencing. **(06)**

OR

(b) Discuss the methodology of RAPD. **(06)**

Q – 6 (a) Give a detailed note on molecular pharming. **(06)**

(b) Describe the role of rDNA technology in improvement of animals using suitable examples. **(06)**

OR

(b) Explain the production of insulin and hirudin through rDNA technology. **(06)**

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