

## SARDAR PATEL UNIVERSITY

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

Friday, 27<sup>th</sup> April, 2018

10:00 A. M. to 01:00 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. \_\_\_\_\_ prevents DNA from digestion by restriction enzymes.
  - a) Methylation
  - b) Carboxylation
  - c) Decarboxylation
  - d) Hydroxylation
2. \_\_\_\_\_ is a source of cDNA library preparation.
  - a) rRNA
  - b) tRNA
  - c) snRNA
  - d) mRNA
3. \_\_\_\_\_ invented PCR.
  - a) E. M. Southern
  - b) Kary Mullis
  - c) Alwine & coworkers
  - d) Maxam & Gilbert
4. \_\_\_\_\_ °C is the optimum temperature for *E. coli*. DNA polymerase.
  - a) 15
  - b) 75
  - c) 37
  - d) 97
5. Which of the following technique uses both restriction digestion and PCR?
  - a) AFLP
  - b) RFLP
  - c) RAPD
  - d) DGGE
6. ddNTP is modified at which part of nucleotide?
  - a) Nitrogen base
  - b) Phosphate backbone
  - c) 2' carbon of pentose sugar
  - d) 3' carbon of pentose sugar
7. \_\_\_\_\_ is used as a host in edible vaccines.
  - a) Plant
  - b) Bacteria
  - c) Animal
  - d) Virus
8. \_\_\_\_\_ is the example of transgenic plant.
  - a) Polly
  - b) Flavr savr
  - c) Dolly
  - d) All of these

[P.T.O.]

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

1. Give function and application of alkaline phosphatase in biotechnology.
2. What is sequenase enzyme?
3. Give the role of chloroform and EDTA in DNA isolation.
4. Calculate melting temperature for the given primers and suggest annealing temperature for that PCR reaction.  
F.P.: CTAGGGCGCAGCACTAG  
R.P.: AGGAACTGCCAGTGCGA
5. What are the limitations of PCR?
6. Narrate chemicals used in chemical degradation method of sequencing.
7. What is the difference between dominant and co-dominant marker system? Classify different DNA fingerprinting techniques based on that system.
8. List examples of diseases treated by gene therapy.
9. What is metagenomics?

Q-3 (a) Discuss RM system with suitable example. (06)  
(b) Write a note on : *Taq* DNA polymerase & DNA polymerase (06)

OR

(b) Explain DNA modifying enzymes in detail. (06)

Q-4 (a) Write a note on real time PCR. (06)  
(b) Give advantages and disadvantages of PCR. (06)

OR

(b) Discuss hot start PCR and ARMS PCR. (06)

Q-5 (a) Explain the methods used in radiolabeling of probe. (06)  
(b) Describe Sanger-Coulson method of sequencing in detail. (06)

OR

(b) What is a Molecular marker? Discuss methodology, advantages and disadvantages of AFLP. (06)

Q-6 (a) Give application of rDNA technology in improvement of animals and microbes. (06)  
(b) Discuss the role of gene therapy in SCID and hypercholesterolemia. (06)

OR

(b) Explain various techniques applied in molecular diagnostics. (06)

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