(24A)

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# SARDAR PATEL UNIVERSITY

## B.Sc. (Genetics) – Sixth Semester Examination (CBCS)

## Tuesday, 28th March, 2017

## 10:00a.m. to 1:00 p.m.

## US06CGEN02: Recombinant DNA Technology

**Total Marks: 70**

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

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**Q. 1** **Choose the most appropriate answer from the four alternatives given:** **[10]**

i. **Which of the following is true regarding PCR?**
(a) Denaturation involves heating at 90°-98°C
(b) Annealing involves binding of primer between 40°-60° C.
(c) Primer extension occurs at 72°C
(d) All of these

ii. **Reverse transcriptase PCR uses.....**
(a) mRNA as a template to form cDNA (b) RNA as a template to form DNA
(c) DNA as a template to form ssDNA (d) All of these

iii. ***Thermus aquaticus* is the source of .....**
(a) Taq polymerase (b)Vent polymerase (c) Both (a) and (b) (d) Primase enzyme

iv. **Which of the following is not a DNA sequencing method?**
(a) LMPCR (b) Edmans method (c) Sanger's method (d) Maxam-Gilbert method

v. **DNA microarrays are used for.....**
(a) DNA variation screening (b) Gene expression profiling
(c) Microarray comparative genomic hybridization (d) All of the above

vi. **Molecular markers are used to construct.....**
(a) Chromosome maps (b) Physical maps
(c) Cytogenetic maps (d) All of these

vii. **RFLP is used to.....**
(a) Construct high resolution linkage maps (b) Identify single gene disease
(c) Construct QTL maps (d) All of these

viii. **DNA finger printing was developed by.....**
(a) Francis Crick (b) Khorana (c) Alec Jeffrey (d) James Watson

ix. **Which of the following is the substrate for *ribozymes*?**
(a) Proteins. (b) Metal ions. (c) Ribosomes. (d) RNA.

x. **Small Interfering RNAs are capable of**
(a) Being translated. (b) Interfering with transcription.
(c) Leading to the destruction of certain mRNAs. (d) Cutting up other RNAs



(P.T.O.)

**Q.2** **Answer any TEN from the following:** **[20]**

i. Differentiate between multiplex PCR and nested PCR.
ii. What do you mean by primer designing?
iii. Write a short note on principle of PCR.
iv. What is gene sequencing?
v. Write the salient feature of enzymatic DNA sequencing method.
vi. Write the various advantages of gene sequencing.
vii. Define DNA finger printing and its significances in genetics.
viii. What do you mean by non PCR and PCR based method?
ix. What is SNP analysis?
x. Write a short note on gene knockouts.
xi. What is Knock out mice?
xii. What is Dicer?

**Q.3** (a) What is PCR? Discuss any two type of PCR studied by you and its advantages. **[06]**

(b) Write a note on various applications of PCR. **[04]**

**OR**

**Q.3** (a) Explain in detail about chemical synthesis of oligonucleotides. **[06]**

(b) Discuss in detail about touch down PCR. **[04]**

**Q.4** (a) Write a detail note enzymatic DNA sequencing method. **[05]**

(b) Give an account on introduction and applications of microarray technology. **[05]**

**OR**

**Q.4** (a) Give a detail account on automated DNA sequencing. **[06]**

(b) Write a note on protein sequencing. **[04]**

**Q.5** (a) What do you mean by molecular markers? Explain in detail about any two PCR based molecular markers studied by you. **[10]**

**OR**

**Q.5** (a) Give a detail account on molecular genetic approaches in forensic sciences. **[05]**

(b) Write a note on morphological and biochemical markers with suitable examples. **[05]**

**Q.6** (a) What is site directed mutagenesis? Discuss any one PCR based technique for it. **[10]**

**OR**

**Q.6** (a) Write a detail note on any one technique of gene silencing with its applications. **[05]**

(b) Discuss in detail about siRNA technology. **[05]**

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