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SEAT No._____

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(44)

SARDAR PATEL UNIVERSITY

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

Wednesday, 28th March, 2018

10:00 a.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.

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

i. **The first step in PCR is .....**
(a) Denaturation (b) Annealing (c) Primer extension (d) Cooling

ii. **The PCR is used to.....**
(a) Amplify a small amount of DNA (b) Cleave bacterial plasmids
(c) Seal sticky ends (d) Identify target plasmid

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

iv. **..... refers to methods for determining the order of the nucleotides bases.**
(a) Protein sequencing (b) DNA sequencing
(c) Enzyme sequencing (d) None of the above

v. **..... method requires radioactive labelling**
(a) Automated DNA sequencing (b) Dye-terminator sequencing
(c) Maxam-Gilbert sequencing (d) None of the above

vi. **How many ddNTPs are used in Sanger's methods?**
(a) One (b) Two
(c) Three (d) Four

vii. **Variation in one DNA fragments obtained with a specific enzyme is treated as one.....**
(a) RFLP (b) RAPD (c) SSR (d) All of them

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

ix. **Gene knockout models are widely used to study the.....**
(a) Structure of genes (b) Site of genes. (c) Function of genes (d) All of them

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

(P.T.O.)

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

i. What is PCR? Differentiate between colony PCR and hot start PCR.
ii. What do you mean by primer designing?
iii. Write a short note on first and second steps of PCR.
iv. Differentiate between chemical sequencing and pyrosequencing.
v. Write the salient feature of sequencing method.
vi. Write a short note on automated DNA sequencing.
vii. Write the significances of molecular markers in genetics.
viii. What do you mean by biochemical markers?
ix. What is SNP analysis?
x. What do you mean by gene knockouts?
xi. Write a short note on micro RNA.
xii. What is Dicer?

Q.3 **(a)** Write is detail note on multiplex and real time PCR including its advantages and disadvantages. **[06]**

(b) Write a note on principle and applications of reverse transcriptase PCR. **[04]**

OR

Q.3 **(a)** Discuss in detail about chemical synthesis of oligonucleotides and its importance in molecular biotechnology. **[06]**

(b) Explain in detail about nested PCR. **[04]**

Q.4 **(a)** What do you mean by gene sequencing? Write a detail note on enzymatic DNA sequencing method. **[05]**

(b) Give an account on protein sequencing. **[05]**

OR

Q.4 **(a)** Give a detail account on introduction and applications of microarray technology in life science. **[06]**

(b) Write a note on Maxam-Gilbert sequencing method. **[04]**

Q.5 **(a)** Write a detail note on DNA fingerprinting and its significance. **[10]**

OR

Q.5 **(a)** Explain in detail about molecular genetics approaches in forensic sciences. **[05]**

(b) Write a note on RAPD as a PCR based molecular marker. **[05]**

Q.6 **(a)** Discuss in detail about site directed mutagenesis and its applications in genetics. **[10]**

OR

(a) What do you mean by gene silencing? Write various applications of gene **[05]**

(b) Write a note on Knockout mice. **[05]**

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