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SEAT No. \_\_\_\_\_

No. of Printed Pages : 2

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**SARDAR PATEL UNIVERSITY**  
**BACHELOR OF SCIENCE (B.SC.)**  
**V<sup>TH</sup> SEMESTER EXAMINATION OCTOBER- 2018**  
**FRIDAY, 26<sup>TH</sup> OCTOBER 2018**  
**10:00 AM TO 01:00 PM**  
**SUBJECT: GENETICS**  
**COURSE: US05CGEN03**  
**(Introduction to Genetic Engineering)**

**DURATION : 03 HOURS**

**TOTAL MARKS: 70**

Figures to the right indicate marks:

**Q1. Multiple Choice questions:**

**(1 x 10 = 10)**

**i) The enzyme that is used to make the first strand of cDNA from mRNA is ;**

- A) Reverse transcriptase                      B) Restriction endonuclease  
C) DNA polymerase                              D) T4 DNA ligase

**ii) The main feature of Shuttle vector is that:**

- A) It can replicate in single host                      B) It can replicate in unique host  
C) It can replicate in two different host                      D) None of the above

**iii) Particle bombardment method is also called as:**

- A) Biolistic method                                      B) Gene gun method  
C) Particle acceleration method                                      D) All of the above

**iv) What is the full form of IBC :**

- A) Indian Biosafety committee                                      B) Institutional Biosafety committee  
C) International Biosafety committee                                      D) Institutional Biotechnology committee

**v) When foreign DNA is encapsulated in biomembranes for transformation is known as:**

- A) Microinjection                      B) Electroporation                      C) Particle gun                      D) Liposomes mediated

**vi) Transfer of T-DNA is stimulated by the product of which genes :**

- A) Target DNA                      B) Selectable marker                      C) Vir genes                      D) Both A & C

**vii) What is the full form of "FISH" technique?**

- A) Fluorescent intrinsic Hybridization                                      B) Fluorescent in situ Hybridization  
C) Fluorochrome in solution Hybridization                                      D) Fluorescent in solution Hybridization

**viii) Pairing of two polynucleotide from different source means :**

- A) Attachment                      B) Denaturation                      C) Hybridization                      D) Blotting

**ix) Hairpin loop formation is a feature in:**

- A) Genomic library                      B) cDNA Library                      C) colony hybridization                      D) Autoradiography

**x) Transfer of RNA from gel to nylon membrane is :**

- A) Southern blotting                      B) Western blotting                      C) Northern blotting                      D) All of the above

(1)

P.T.O

**Q2. Short Answer type questions (Attempt any TEN)**

**(10 x 2 = 20 marks)**

- I) Why TE is preferred for long term storage of DNA?
- II) What are the applications of reverse transcriptase.
- III) Define Restriction enzyme and restriction site.
- IV) What are the main limitations of natural Ti plasmid?
- V) Define transformation. Mention four transformation methods.
- VI) How genetic engineering is beneficial in agriculture?
- VII) What is IPR? Why it is important?
- VIII) Define genomic library and mention its applications
- IX) What is the rationale (principle) of blue- white selection?
- X) What are the advantages of cDNA library.
- XI) What are probes. What is their main significance.
- XII) Define hybridization and blotting technique.

Q.3.A) Explain plasmid DNA isolation by alkali lysis method. (05)  
Q.3.B) Mention features & applications of DNA linkers and Adapters (05)

**OR**

Q.3.A) Mention various features, applications and limitations of Klenow fragment. (05)  
Q.3.B) Give a comparative account of all three classes of Restriction Endonucleases. (05)

Q.4.A) Give comparative account of pBR322 and pUC (05)  
Q.4.B) What are the properties and applications of vectors in genetic engineering. (05)

**OR**

Q.4.) Explain with relevant diagram  $\lambda$ -replacement and  $\lambda$ -insertional vector with example. (10)

Q.5.A) Write a explanatory note on Intellectual Property Rights and its importance. (05)  
Q.5.B) Write a explanatory note on biosafety measures for R-DNA technology. (05)

**OR**

Q.5.A) What are various applications of Genetic engineering for human benefits? (05)  
Q.5.B) Explain any two methods of recombinant selection. (05)

Q.6.A) Write a short note on Northern Blotting technique with diagram. (05)  
Q.6.B) Write an explanatory note on radioactive probes and their types. (05)

**OR**

Q.6.A) Write a short note on Colony Hybridization (05)  
Q.6.B) Draw a flow chart for the construction of cDNA library (05)

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