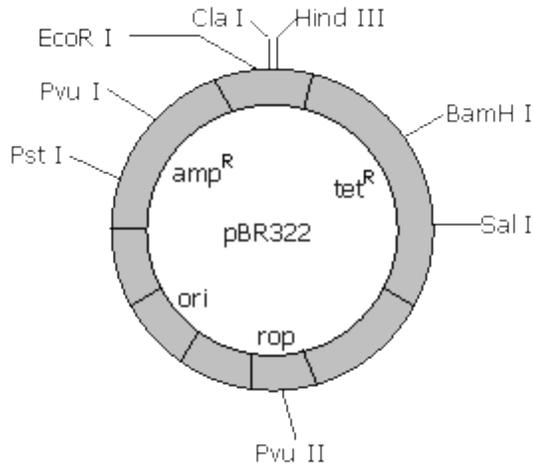


**Class: 12**  
**Subject: Biology**  
**Topic: Biotechnology principles and processes**  
**No. of Questions: 25**

- Q1. What would be the molar concentration of human DNA?
- Q2. Besides better aeration and mixing properties, what other advantages do stirred tank bioreactors have over shake flasks?
- Q3. Collect 5 examples of palindromic DNA sequences by consulting your teacher. Better try to create a palindromic sequence by following base pair rules.
- Q4. Can you think and answer how a reporter enzyme can be used to monitor transformation of host cells by foreign DNA in addition to a suitable marker?
- Q5. Discuss with your teacher and find out how to distinguish between  
a. Plasmid DNA and chromosomal DNA  
b. RNA and DNA
- Q6. Define biotechnology.
- Q7. Name a 'natural genetic engineer' of plants.
- Q8. Name the enzyme involved in the continuous replication of DNA strand. Mention the polarity of the template strand.
- Q9. What are palindromic nucleotide sequences?  
5'----- G A A T T C ----- 3'  
3' ----- C T T A A G -----5'
- Q10. Explain the contribution of *Thermus aquaticus* in the amplification of a gene of interest.
- Q11. What are recombinant proteins? How do bioreactors help in their production?
- Q12. How is DNA isolated in purified form from a bacterial cell?
- Q13. Name two commonly used bioreactors. State the importance of using a bioreactor.
- Q14. A. Explain how to find whether and *E. coli* bacterium has transformed or not when a recombinant DNA bearing ampicillin resistant gene is transferred into it.  
B. What does the ampicillin resistant gene act as in the above case?

- Q15. Why and how bacteria can be made 'competent'?
- Q16. Name the source of the DNA polymerase used in PCR technique. Mention why it is used.
- Q17. Write any four ways used to introduce a desired DNA segment into a bacterial cell in recombinant technology experiments.
- Q18. What is the principle of PCR?
- Q19. Write the major steps involved in gene cloning.
- Q20. Do you see the prospects of viroids being used as plant vectors in near future?
- Q21. Which part would be most suitable for raising virus-free plants for micropropagation?
- a) Meristem
  - b) Node
  - c) Bark
  - d) Vascular tissue
- Q22. For transformation, micro-particles coated with DNA to be bombarded with gene gun are made up of
- a) Silicon or Platinum
  - b) Gold or Tungsten
  - c) Silver or Platinum
  - d) Platinum or Zinc

Q23. The figure below is the diagrammatic representation of the E.coli vector pBR 322. Which one of the given options correctly identifies its certain component(s)?



- a) Hind III, EcoRI-selectable markers
  - b) amp<sup>R</sup>, tet<sup>R</sup>-antibiotic resistance genes
  - c) ori-original restriction enzyme
  - d) rop-reduced osmotic pressure
- Q24. In plant biotechnology, PEG is used in
- a) Protoplast fusion
  - b) Cell culture preparation
  - c) Protoplast isolation
  - d) Hardening

Q25. Polyethylene glycol method is used for

- a) Energy production from sewage
- b) Gene transfer without a vector
- c) Biodiesel production
- d) Seedless fruit production

askITians