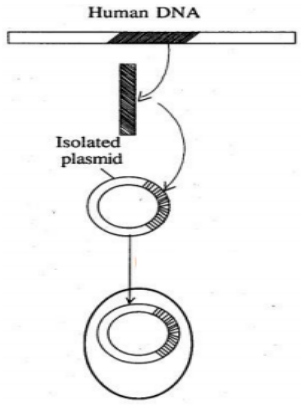
QB365 Question Paper Software
12th Standard - Biology
Biotechnology: Principles and Processes Case Study Questions

Exam Time: 00:30 Hrs | Date: 2025-10-14
Total Marks: 8

Questions:

Case Study Questions

1. 

(a) Name the particular technique in Biotechnology, whose steps are shown in the figure.
(b) Name the steps 1 to 4 marked in the figure.
(c) Give an example where a human gene product is. obtained from transgenic bacteria.

2. **Read the following and answer any four questions from (i) to (v) given below :**
Rama lives in a society where a robbery occurred last night. Robbers came into the flat ar into the flat. They took samples from the room, where the dead body was found. While ex old lady. According to their observation, police filtered out their inspection to three suspe caught the criminal. It was the old lady's cook. Rama was amazed to see that how quickly did it? The police man told her that it become possible due to the sample collected from tl was amplified using PCR and then tested.
(i) What technique was used by the police to identify the criminal?
(a) DNA fingerprinting (b) Gel electrophoresis (c) Molecular diagnosis (d) Clonning
(ii) In PCR, the temperature used to denature the DNA is about
(a) 76° C (b) 25°C (c) 95°C (d) 40°C.
(iii) Which of the following statements regarding PCR is correct?
(a) Taq polymerase, which is isolated from bacterium Thermus aquaticus is stable at
(b) With the help of DNA ligase, the complementary sticky ends of the DNA are joine
(c) Since the sequence of primers are complementary to 5' end of the template DNA
(d) DNA purified from the cell is precipitated by adding hot ethanol.
(iv) Taq polymerase synthesises DNA region between the primers using
(a) Mg^{2+} (b) dNTPs (c) DNA ligase (d) both (a) and (b).
The correct order of steps in Polymerase Chain Reaction (PCR) is
(a) Denaturation, Extension, Annealing (b) Extension, Denaturation, Annealing (c) De

Answers Key:

Case Study Questions

1. (a) Recombinant DN Atechnology/Genetic engineering.
   (b) 1. Isolation of the desired segment of DNA.
   2. Ligation of the isolated DNA to a plasmid vector.
   3. Introduction of rDNA into the bacterial cell.
   4. The bacterium produces the gene product.
   (c) Human insulin is produced by transgenic Escherichia coli cells.
2. **(i) (a) :** DNA fingerprinting is one of highly accurate application of biotechnology. It is helpful in solving crime, legal disputes, establishing identity of criminal or parents, etc.
   (ii) (c) : In PCR, during denaturation, the target DNA is heated at high temperature resulting in the separation of the two strands.
   (iii) (b) : Taq polymerase isolated from bacterium Thermus aquaticus is stable at high temperature. Sequence of primers are complementary to 3' end of the template. Purified DNA is precipitated by adding chilled ethanol.
   (iv) (d)
   (v) (c) Denaturation, Annealing, Extension