Question set for RDT and genetic engineering, paper XIII, B.Sc. 6th sem

Multiple Choice Questions

1. Which of the following statements is true regarding DNA cloning?
   a) Recombinant DNA is formed when bacterial cell reproduces asexually
   b) Plasmids are used often because they are extremely complex
   c) DNA ligase recognises one or two DNA fragments before cutting occurs
   d) DNA target sequences are recognized and cut by restriction enzymes

2. What would the generally expected effect on the PCR reaction be of adjustments that increase the temperature of the annealing phase and the length of the elongation phase?
   a) precision and yield will be reduced
   b) precision will be reduced, but yield will be increased
   c) precision will be increased, but yield will be reduced
   d) precision and yield will be increased

3. Which of the following contains the key tools for recombinant DNA technology?
   (i) Restriction endonucleases, ligases, vectors(ii) Ligases, host organism, polymerase enzymes(iii) Vectors, Taq polymerase, primers(iv) Restriction exonucleases, ligases, primers, bioreactors
   a) i, ii, iii
   b) i and ii
   c) Iii and iv
   d) I, ii, iii and iv
4. Chain-termination is a type of _____
   a) Sequencing
   b) Vector generation
   c) Antibiotic production
   d) Gene manipulation

5. choose the correct statement for real time PCR

   a) End-point PCR is favourable over real time PCR

b) In real time PCR, quantification is done as the reaction is going on

c) If the product measurement is done after the completion then the measurement is done by target sequence and no other factor affects it

d) If the primers are available in limited amount, then the product obtained is proportional to the target sequence

6. Who developed the chemical techniques to synthesize polynucleotides?

a) Barbara McClintock

b) James Watson

c) Fredrick Sanger

d) H. Gobind Khorana

7. Which of the following enzymes in bacteria are responsible for restricting the growth of viruses?

a) restriction endonuclease

b) topoisomerase

c) gyrase

d) protease

8. Vir genes required for the T-DNA transfer and processing are located

a) on the T-DNA

b) outside the T- DNA region

c) on the plant genome

d) none

9. Because of large size of Ti-plasmid, intermediate vectors (IV) are developed in which T DNA has been subcloned into

a) pBR 322 based plasmid vector

b) pRK 2013

c) pRN 3

d) all of these

10. Virulent strains of Agrobacterium contain large Ti-plasmids, which are responsible for the DNA transfer and subsequent disease symptoms. It has been shown that Ti-plasmids contain

a) one set of sequence necessary for gene transfer
b) two sets of sequence necessary for gene transfer
c) three sets of sequence necessary for gene transfer
d) four sets of sequence necessary for gene transfer

write one line answer.

1. What are plasmids?
2. Which technique is commonly used to isolate DNA fragments?
3. Name the enzyme which is also called “molecular scissors”.
4. Name the selectable markers of E, coli.
5. List the features of a vector required to facilitate cloning.
6. Name the stain used in gel- electrophoresis.
7. Mention the function of DNA ligase.
8. Name the products of DNA technology.
9. Who is the father of DNA fingerprinting in India?
10. What is a competent host?

Short answer

1. Write short notes on any 5 topics from given
   a) Steps of PCR
   b) Dot blot assay
   c) Agarose gel electrophoresis
   d) RFLP
   e) RAPD
   f) Insulin: human protein replacement
   g) Chain termination method
   h) Western blotting
2. What is real time PCR, write the Principle and applications of real-time PCR.
3. Explain genomic and C-DNA library. What is the difference between genomic and C-DNA library?
4. Explain Maxim-Gilbert’s and Sanger’s method.
5. Define recombinant DNA technology and briefly describe the steps carried out during the process.

6. What is a restriction modification system? Discuss its different types.
7. What are the properties of a cloning vector? Discuss about plasmid based cloning vectors.

Long answer

1. Describe amplification of nucleic acids by PCR, what are the steps and enzymes involved. What should be taken care for designing a primer for PCR.
2. Describe DNA sequencing. What is the need of DNA sequencing and explain the methods used for DNA sequencing?
3. What is the difference between agarose gel and SDS-PAGE? Explain SDS-PAGE and its applications.
4. Give an account of the different types of enzymes used in recombinant DNA technology.
5. What are the different processes employed in physical method of gene delivery?
6. Discuss in detail about the Ti-plasmid based vectors.