Printed Page:- Subject Code:- ABT0405

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2021 - 2022)

Subject: rDNA Technology

Time: 3 Hours Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1-a. This is not a cloning factor. (CO1) 1

(a) pUC19

(b) SV40

(c) EST

(d) M13

1-b. There are various methods to distinguish whether a colony contains a recombinant or not. One such method is _____ (CO1) 1

(a) blue white screening

(b) checking whether replication is taking place or not

(c) checking the number of copies

(d) looking for the multiple cloning site

1-c. The vaccines prepared through recombinant DNA technology are (CO2) 1

(a) Third generation vaccines

(b) First generation vaccines

(c) Second generation vaccines

(d) None

1-d. Southern blotting is (CO2) 1

(a) Attachment of probes to DNA fragments

(b) Transfer of DNA fragments from electrophoresis gel to a nitrocellulose sheet

(c) Camparision of DNA fragments to two sources

(d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane

1-e. Thermostable DNA polymerases are very important in PCR. How are they obtained? (CO3) 1

(a) They are obtained by heating the bacteria manually over high temperatures

(b) They are isolated from extremely stable thermophilic bacteria which are often found growing in oceanic vents

(c) They are found everywhere in nature

(d) They are obtained by genetically modifying the E. coli bacteria with thermal stability property

1-f. Which of the following enzyme is said as reverse transcriptase? (CO3) 1

(a) DNA dependent DNA polymerase

(b) RNA dependent RNA polymerase

(c) RNA dependent DNA polymerase

(d) DNA dependent RNA polymerase

1-g. Choose the incorrect statement for the preparation of genomic libraries. (CO4) 1

(a) The first step is the isolation of genomic DNA

(b) Physical damage to the DNA should be avoided

(c) If a nuclear DNA library is to be constructed, organelle DNA is to be removed

(d) For the construction of organelle library, organelle DNA is purified from the nuclear DNA

1-h. To avoid ligation of separate DNA fragments, which of the enzyme is used? (CO4) 1

(a) kinase

(b) ligase

(c) endonuclease

(d) phosphatase

1-i. What properties of a protein does hydrophobic interaction chromatography exploit for purification? (CO5) 1

(a) Charged amino acids

(b) Hydrophobic amino acids on the protein surface

(c) Molecular weight

(d) Enzyme activity

1-j. Is DNA ligase g enzymes is used in pyrosequencing? (CO5) 1

(a) TRUE

(b) FALSE

2. Attempt all parts:-

2.a. What do you understand by reverse transcriptase in cloning ? (CO1) 2

2.b. Name the different type of vectora that are used in recombinant DNA technology. (CO2) 2

2.c. What is the structure and function of DNA Polymerase III ? (CO3) 2

2.d. What is the procedure for recombinant cell selection? (CO4) 2

2.e. What is the principle of microarray? (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Which enzymes are used in homopolymer tailing technique? (CO1) 6

3-b. Expalin the applications of rDNA technology. (CO1) 6

3-c. Discuss the components of a PUC19 vector. (CO2) 6

3-d. What is the difference between PUC18 AND PUC 19 ? (CO2) 6

3.e. Explain the steps of multiplex PCR. (CO3) 6

3.f. Write a brief note on northern blotting with a diagrammatic representation. (CO4) 6

3.g. Purified protein is obtained at what point in the recombinant protein purification process? (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4-a. Why human cloning is banned explain this in detail? (CO1) 10

4-b. How restriction enzymes works explain in detail? (CO1) 10

5. Answer any one of the following:-

5-a. What would happen if the restriction enzymes do not cut the DNA at specific recognition sequences? (CO2) 10

5-b. What are the properties that u should keep in mind when preparing a artificial 10

chromosomes? (CO2)

6. Answer any one of the following:-

6-a.	Give a description of the primers used in PCR. (CO3)	10
6-b.	For which process we use SYBR Green and Taqman. Explain in detail. (CO3)	10

7. Answer any one of the following:-

7-a.	Give a detailed description of colony and plaque hybridisation. (CO4)	10
7-b.	What do you mean by complementation of a defect in a cell line? (CO4)	10

8. Answer any one of the following:-

8-a.	Discuss in detail shotgun method in cloning genomic DNA. (CO5)	10
8-b.	What exactly does clone-by-clone sequencing imply?What are the pros and cons of clone-by-clone sequencing? (CO5)	10