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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December - 2020

(Fifth Semester)

BBTPC5010- Genetic Engineering andr-DNA Technology

(Biotechnology)

Time: 2hrs

Maximum; 50 Marks

Answer ALL Questions**The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10= 10 Marks)**Q.1. Answer ALL questions

[CO#]

[PO#]

- | | | |
|--|---|---|
| a. The loop region is single stranded. It can be cleaved by using which enzyme?
(i) Exonuclease
(ii) S1 nuclease
(iii) RNaseH
(iv) DNase | 1 | 5 |
| b. Choose the incorrect statement for the method homopolymer tailing.
(i) The first step is the RNA: DNA hybrid synthesis
(ii) Terminal transferase is used for the addition of nucleotides on 3' end
(iii) Terminal transferase adds only at DNA strands
(iv) The DNA strand is now having known sequence at 3' end | 1 | 2 |
| c. What is the final product of the RNaseH method?
(i) blunt ended dsDNA
(ii) staggered dsDNA at both ends
(iii) staggered dsDNA at 3' end
(iv) staggered dsDNA at 5' end | 1 | 1 |
| d. The process of amplification of specific DNA sequences by an enzymatic process is termed as
(i) amplification
(ii) polymerase chain reaction(PCR)
(iii) translation
(iv) microarrays | 2 | 4 |
| e. Which of the characteristics is present in lacZ gene?
(i) It encodes for beta galactosidase enzyme
(ii) Beta galactosidase enzyme is responsible for cleaving monosaccharides into the constituent elements
(iii) It doesn't cleaves a substrate called as X-gal
(iv) But if X-gal is cleaved, it liberates pink coloured dye | 2 | 1 |
| f. RNA can be synthesized by using vector. A vector with _____ is used and further through _____ RNA is isolated.
(i) origin of replication, translation
(ii) promoter, transcription
(iii) promoter, translation
(iv) origin of replication, transcription | 3 | 2 |
| g. Proteins synthesized by carrying out a translation of the vector region and continuing it in the insert region is called as _____
(i) hybrid protein
(ii) fusion protein
(iii) combination protein
(iv) insert protein | 3 | 3 |
| h. How many approaches are there in order to clone the complete genome?
(i) 1
(ii) 2
(iii) 3
(iv) 4 | 4 | 1 |
| i. If a putative protein sequence is cloned in an expression vector and the expressed | | |

- protein is not showing protease activity, then which of the following is not correct?
- (i) The protein is not protease (ii) The protein can be incorrectly folded which can block the protease activity
- (iii) There might be some other cofactor required for protease activity (iv) The most commonly used expression system is E.coli
- 4 4
- j. For getting a large amount of proteins to crystallize, which of the following should be used as an expression system?
- (i) Bacterial system (ii) Yeast systems 4 3
- (iii) Eukaryotic systems (iv) Both eukaryotic and bacterial systems can be used

PART – B: (Short Answer Questions)

(2 x 5=10 Marks)

<u>Q.2. Answer ALL questions</u>	[CO#]	[PO#]
a. What are DNA and RNA markers? Give an example for each.	1	1
b. Define Cosmid.	2	5
c. What is site directed mutagenesis?. Give an example.	3	6
d. Write Short notes on Gene Mapping.	4	5
e. What is gene Therapy?	4	6

PART – C: (Long Answer Questions)

(6 x 5=30 Marks)

<u>Answer ANY FIVE questions</u>	Marks	[CO#]	[PO#]
3. Write the basic principle of Isolation and Purification of DNA.	(6)	1	1
4. Explain on Bacteria based Expression vectors.	(6)	1	3
5. How do you clone differentially expressed genes? Explain.	(6)	2	7
6. Explain the principle and mechanism of micro arrays with pictorial representations.	(6)	2	5
7. Explain the Sanger sequencing method of DNA with a neat diagrammatic representation.	(6)	3	5
8. How are heterologous genes expressed in <i>in vitro cloning</i> techniques?. Explain.	(6)	3	3
9. Discuss the Principle, Mechanism and applications of RFLP technique in GE.	(6)	4	5
10. Discuss on Genetic Engineering Regulations and Safety guidelines.	(6)	4	7

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