Register Number: ……..

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Fifth Semester

BIOTECHNOLOGY

BTY112: Genetic Engineering

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Promoter is ……acting element with respect to transcription function
   a) Either cis or trans b) Trans
   c) Both cis and trans d) cis
2. Role of terminal transferase in DNA modification is
   a) Addition of deoxynucleotides to 5' end b) Addition of PO4 to 3' end
   c) Addition of PO4 group to 5' end d) Addition of deoxynucleotides to 3' end
3. Cloning capacity of cosmid vector is
   a) 15kbp b) 500kbp
   c) 50kbp d) 10kbp
4. Selectable marker gene in pUC18 vector is ……....
   a) $Step^r$ b) Amp^r
   c) Kan^r d) Tet^r
5. The size of the genome is 2 .8x10^6 and size of the insert is 20kbp. How many numbers of clones are required to get the gene of insert with 95% probability?
   a) 4.2x10^4 b) 2.2x10^5
   c) 4.2x10^5 d) 4.2x10^4
6. Effective method of screening a cDNA library is
   a) PCR based screenings b) Colony hybridization
   c) Immunochemical screening d) Plaque lifting
7. Annealing is a ……. step in PCR cycle
   a) Last b) First
   c) Third d) Second
8. TagMan is a
   a) Primer complementary to the gene of interest b) Primer with Q and R molecules
   c) Forward primer in RT PCR d) a and b
9. The role of Dicer in RNAi is ….
   a) Blocking translation of mRNA b) Cleaving mRNA
   c) Generating Si RNA d) Amplifying mRNA
10. Regulatory committee which monitors the genetic manipulation in India is…
    a) IBSC b) RDAC
    c) DLC d) GEAC

PART B (10 x 2 = 20 Marks)

11. Draw the typical structure of prokaryotic gene.
12. What is the significance of using alkaline phosphatase during gene cloning?
13. Comment on use of shuttle vector with suitable example.
14. Draw the vector map of typical bacterial expression vector.
15. Naturally occurring plasmids are not directly used for cloning work-Why?
16. Genomic library is not preferred for gene isolation in eukaryotic system-comment on the statement
17. List out various types of molecular markers used in forensic sciences.
18. Give examples for engineered enzymes used in industries.
19. Give examples for transgenic plants that are commercially cultivated.
20. Differentiate Si RNA and Mi RNA.

PART C (5 x 14 = 70 Marks)

21. a) (i) Discuss the following transformation methods with suitable illustration (10)
        i. Microinjection method
        ii. Gene gun method or particle bombardment method
    (ii) What are the limitations of electroporation method of transformation? (4)

    (OR)

    b) (i) Write the steps involved on linker and adopter mediated gene cloning strategies (12)
    (ii) What is directional cloning? (2)

22. a) (i) Write short note on the following types of vectors (10)
        i) YAC
        ii) Lambda replacement vector

    (ii) Explain the importance of including RBS in expression vector. (4)

(OR)

b) Discuss on steps involved baculovirus gene transfer vector and note on expression of eukaryotic genes in insect cell lines rather than *E.coli*.

23. a) (i) Explain the steps involved in construction of a genomic library with suitable illustration. (10)

(ii) How will you isolate your gene interest from genomic library using colony hybridization method? (4)

(OR)

b) (i) How will you construct cDNA library from mRNA isolated from a tissue? (10)

(ii) Suggest a method to isolate gene of interest from cDNA library. (4)

24. a) Discuss a SDM strategy to engineer an enzyme to have high temperature stability for industrial applications.

(OR)

b) (i) What is the principle of dideoxy nucleotide method of nucleic acid sequencing? and explain steps involved sequencing the given DNA fragment using Sangers method. (12)

Sequence: 5'AGGGGCCATT3'

(ii) What are the advantages of Sanger's method over Maxam-Gilbert method? (2)

25. a) Discuss on biosafety rules and regulations to be followed while working with recombinant DNA technology.

(OR)

b) Explain the steps involved in generating transgenic cotton plant for insect resistance using agrobaterium mediated method.

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