

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc.DEGREE EXAMINATION –BIOTECHNOLOGY

SECOND SEMESTER – APRIL 2019

17/18PBT2MC01– MOLECULAR BIOLOGY AND GENETIC ENGINEERING

Date: 03-04-2019
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x 1 = 5 Marks)

- _____ is seen when a dominant allele blends with the recessive allele
a) Codominance b) Dominance
c) Incomplete dominance d) Penetrance
- In a diploid organism with 30,000 bases haploid genome contains 23% A residues. What is the number of G residues in the genome of this organism?
a) 16000 b)16200 c)16500 d)14200
- In -linked glycoprotein, the carbohydrates are attached to which of the following bases?
a)Valine b)Threonine
c)Asparagine d) Serine
- The size of mouse genome is 5.6×10^6 Kb and average cloned fragment size is 40kb. How many minimum number of clones are required to represent a particular sequence ?
a) 0.5×10^5 b) 1.4×10^6
c) 7×10^5 d) 1.2×10^6
- How many DNA duplex is obtained from one DNA duplex after 4 cycles of PCR?
a) 4 b) 8 c) 16 d) 32

II. State whether the following are true or false.

(5x1=5 Marks)

- Linked genes are not recombined.
- N6 of purine are more prone to damage by alkylating agents.
- RNA polymerase does not need primers for synthesis.
- YACs can replicate in *E.Coli*
- Reverse transcriptase PCR is a quantitative method.

III. Complete the following

(5 x 1= 5 Marks)

- Rolling circle replication is seen in _____.
- _____ are enzymes that cleave between LoxP sites.
- _____ acts a regulatory gene in ara_{BAD} operon.
- _____ PCR is used for gene sizes greater than 5Kb.
- _____ converts the APS to ATP in pyrosequencing.

IV. Answer the following within 50 words

(5 x 1 = 5 Marks)

- State Mendel's law of independent assortment
- What is C value paradox?
- Give an example for expression vector.
- Mention the role of RNA polymerase II
- Name any one method used for enzyme modification in Hotstart PCR.

PART B

Answer the following each within 500 words.

(5 x 8 = 40 Marks)

Draw diagrams wherever necessary

- 21.(a) Discuss about generalized and specialized transduction.
OR
(b) Give an account on Epigenetics.
- 22.(a) Distinguish between A DNA and B DNA.
OR
(b) Summarize the steps in homologous recombination.
23. (a) Evaluate the mechanism of attenuation in *trp* operon.
OR
(b) Write short notes on: i. Glycosylation ii. Phosphorylation.
- 24.(a) Classify vectors based on their packaging size.
OR
(b) Explain the steps involved in genomic DNA library preparation.
25. (a) Give an account on nested PCR and Touch down PCR.
OR
(b) Mention the characteristics of a good primer.

PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Explain the mechanism of DNA replication in bacteria.
27. Describe mRNA processing in eucaryotes.
28. Elaborate on the steps involved in molecular cloning using plasmid.
29. Write in detail about pyrosequencing.
