P P SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination

Dec2020-Jan 2021

SSBT3150–Recombinant DNA Technology II

07.01.2021, Thursday Time: 10:00a.m. to 12:30 p.m. Maximum Marks: 60

Section-A (Total Marks - 20)

Q.1 Objectives (20 MCQ Compulsory-20 mark each) **(20)**

1 Genomic library represents
- **A** Only coding region of an organism
- **B** Coding as well as non-coding regions of an organism
- **C** Only Non- coding regions of an organism
- **D** All the options are correct

2 Which of the following cannot be studied using cDNA libraries
- **A** Alternative splicing
- **B** Regulatory regions of the genes
- **C** Gene function
- **D** Exons

3 Diethyl pyrocarbonate, is used during RNA extraction to:
- **A** extract protein
- **B** inhibitRNAase
- **C** degrade the cell wall
- **D** sepearte RNA from the mixture

4 During Phenol-chloroform extraction, If pH is acidic (4.0)
- **A** RNA will stay in aqueous phase and DNA will be in organic phase
- **B** RNA will stay in organic phase and DNA will be in aqueous phase
- **C** RNA will stay in the interphase and DNA will be in aqueous phase
- **D** None of the options are correct

5 During RNA extraction, _____degrades proteins and inhibit RNAses
- **A** Guanidium thiocynate
- **B** Phenol- Chloroform
- **C** Isopropanol
- **D** All the options are correct

6 Which of the following is/are ideal vector for large inserts
- **A** Cosmids
- **B** λ phages
- **C** BACs
- **D** All the options are true

7 A vector digested with Sau3A enzyme can be ligated to an insert digested with_____
- **A** EcoRI
- **B** XbaI
- **C** BamHI
- **D** HindIII

8 Which component of the bacterial system facilitates the screening of recombinant clones?
- **A** Promoter
- **B** Selection marker
- **C** Origin of replication
- **D** Multiple Cloning Site

9 Which of the following is potential challenge for genomic DNA construction
- **A** Desired gene might be cut internally
- **B** Gene size larger than vector capacity
- **C** vectors have limited capacity to accommodate large insert DNA
- **D** All of the options are true

10 According to the Clarke and Carbon probability formula, which of the following is true
- A number of clones to be screened in a genomic library increases with the increase in the value of P
- B number of clones to be screened in a genomic library decreases with the increase in the value of P
- C number of clones to be screened in a genomic library decreases with the decrease in the value of P
- D None of the options are true

11 In blue white screening, BLUE colonies represent
- A Transformed and recombinant cells
- B Transformed but non-recombinant cells
- C Untransformed and recombinant
- D Untransformed and non-recombinant

12 Probe is a
- A Protein for detecting a specific DNA molecule
- B Short piece of labelled DNA which are complementary to the nucleic acid strand to be detected
- C Short piece of labelled DNA or RNA which are complementary to the nucleic acid strand to be detected
- D None of these

13 Labelled antibodies are used to detect
- A The presence of a particular DNA molecule in Southern blotting
- B The presence of a particular RNA molecule in Southern blotting
- C The presence of a particular Protein molecule in Southern blotting
- D The presence of a particular Protein molecule in Western blotting

14 According to Clarke and carbon probability formula, if organism A has larger genome size than organism B (P=95% for both organisms); then minimum number of clones with 45 kb DNA insert size, to be screened will be:
- A More for Organism A than B
- B More for Organism B than A
- C Equal for both the organisms A and B
- D None of the options are correct

15 For _____insert, λ replacement vector can be used
- A 20 Kb
- B 45Kb
- C Both 20 and 45 Kb insert can be used
- D None of the options are true

16 In a given genome, the average spacingbetween HindIII sites (six-base-long HindIIIsequence) is approximately_____
- A 0.25 Kb
- B 4Kb
- C 8 Kb
- D 6 Kb

17 While cloning in EMBL4 vector, which of the following site in a recombinant genomes are cut to be packaged into phage heads
- A Right arm
- B Cos site
- C Left arm
- D All the optionts

18 Chain-terminating ddNTPs used in Sanger sequencing perform the chain termination by:

A 3'H prevents strand extension
B 5'P prevents strand extension
C 3'OH prevents strand extension
D All the options are correct

19 In _____ each base emits a unique fluorescent signal, which is being recorded

A Ion Torrent sequencing
B Sanger sequencing
C Illumina sequencing
D Maxam- Gillbert sequencing

20 _____measures the direct release of H+ (protons) from the incorporation of individual bases

A Illumina sequencing
B Ion Torrent sequencing
C Maxam- Gillbert sequencing
D Solexa sequencing

Section-B (Total Marks - 40)

Q.1 Short Notes (attempt allfour compulsory- 3 marks each) **(12)**

A Steps of cDNA library sysnthesis

B Sanger Sequencing

C Immunoscreening

D Replacement vector vs Insertion vector

Q.2 Explain in detail (attempt anyfour compulsory-7 marks each) **(28)**

A Discuss different strategies to prepare Genomic library?

B Describe different methods of radioactive and non-radioactive probe labelling?

C What is high throughput sequencing? Explain two most widely used Next generation sequencing methods in detail

D What is Colony Hybridization? Explain each step-in detail

E Explain Maxam Gilbert Sequencing in detail?