

1. Which of these techniques is often considered a suitable “polishing” step in a protein purification?

- A) Affinity Chromatography
- B) Ion –Exchange Chromatography
- C) Hydrophobic interaction Chromatography
- D) Size-exclusion Chromatography

2. What properties of a protein does hydrophobic interaction chromatography exploit for purification?

- A) Charged amino acids
- B) Hydrophobic amino acids on the protein surface
- C) Molecular Weight
- D) Enzyme activity

3. Which of these effects result from slow injection of a large sample volume?

- A. Increased resolution
- B. Decreased resolution
- C. Non-linear detector response
- D. Constant resolution

4. Which of the following are not used as stationary phases in a GC column?

- A. Polysiloxanes
- B. Silica
- C. Cyclodextrins
- D. None are used as stationary phases

5. In a chromatographic separation, which of the following indices is most appropriate for the qualitative identification of a substance?

- A) Relative retention factor R_{rel}
- B) Retention factor R_f
- C) Retention time

D) Resolution

6. In SDS-PAGE, the protein sample is first

- A. treated with a reducing agent and then with anionic detergent followed by fractionation by electrophoresis
- B. fractionated by electrophoresis then treated with an oxidizing agent followed by anionic detergent.
- C. treated with a oxidizing agent and then with anionic detergent followed by fractionation by electrophoresis
- D. none of the above

7. In isoelectric focusing, proteins are separated on the basis of their

- A. relative content of positively charged residue only
- B. relative content of negatively charged residue only
- C. size
- D. relative content of positively and negatively charged residue

8. Which of the following is used to visualize live cells?

- A) TEM
- B) SEM
- C) Confocal microscope
- D) Phase contrast Microscope

9. The electrons of Scanning Electron Microscope are reflected through

- A) glass funnel
- B) specimen
- C) metal-coated surfaces
- D) vacuum chamber

10. Fermentation is the

- A) production of alcoholic beverages by microorganisms.
- B) mass, controlled culture of microbes to synthesize products.
- C) use of microbes in sewage and pollution control.
- D) all of the above.

11. The production of substances in industrial microbiology occur in the sequence:

- A) fermentation, downstream processing, removal of waste, inoculation.
- B) inoculation, downstream processing, fermentation, removal of waste.
- C) inoculation, fermentation, downstream processing, removal of waste.
- D) removal of waste, inoculation, fermentation, downstream processing.

12. "Superbug" was a name coined for organisms engineered for

- A)antibiotic production.
- B)probiotic production.
- C)hydrocarbon degradation.
- D)enzyme production.

13. Which of the following best describes biodegradation?

- A) A minor change in an organic molecule
- B) Fragmentation of a complex organic molecule
- C)Complete transformation of the organic molecule to mineral forms
- D)All of the above

14. If a batch culture is continuously or sequentially fed with fresh medium without remaining the growing culture, it is called

- A) Batch Culture
- B) Fed-Batch Culture
- C) Continuous Culture
- D) Another Culture

15. During the enzymatic reaction of an immobilized enzyme, the rate of substrate transfer is

- A. equal to that of substrate consumption
- B. more than that of substrate consumption
- C. lesser than that of substrate consumption
- D. is nothing to do with the substrate consumption

16. For a steady state condition, the change of substrate concentration (dC_s/dt) is

- A. zero
- B. 1
- C. >1
- D. <1

17. The support material for immobilization of cells of *Bacillus subtilis* is

- A. ion exchange resins
- B. gelatin
- C. Anthracite
- D. agarose and carbodiimide

18. The number of substrate molecules converted to product in a given unit of time by a single enzyme molecule at saturation is referred to as the:

- A) dissociation constant.
- B) maximum velocity.
- C) Michaelis-Menten number.
- D) turnover number.

19. Which of the following statements is true with respect to phosphate prodrugs?

- A) Phosphate esters are more polar in nature than the parent drug.
- B) Phosphate esters are less water soluble than the parent drug.
- C) Phosphate esters are more likely to cross cell membranes than the parent drug.
- D) Phosphate esters are resistant to drug metabolism.

20. Which one of the following is a group of proteolytic enzymes?

- A) Bromelin and Papin
- B) Callulase and myrosinase

C) Maltase and diastase

D) Phosphatase and Chlorophyllase

21. The cleavage specificity of trypsin and chymotrypsin depend in part on the

A. proximity of Ser 195 to the active site or specificity pocket

B. size, shape, and charge of the active site or specificity pocket

C. presence of a low-barrier hydrogen bond in the active site or specificity pocket

D. absence of water in the active site

22. Which of the following gene detoxifies herbicide phosphinothricin?

A. Nitrilase

B. Glutathione S-transferase (GST)

C. Phosphinothricin acetyl transferase

D. All of these

23. Transplastomics

A. targets genes in the chloroplast

B. provides exceptionally low yields of protein products

C. produces genes that are released in pollen

D. offers little opportunity for practical use

24. Which of the following has been widely used to provide resistance against plant viruses?

A. Virus resistance genes from bacteria

B. Expression of virus coat protein genes in transgenic plants

C. Expression of anti-virus genes in vectors that transmit viruses

D. Expression of ribonuclease (RNase) genes in host plants

25. The roots of a plant are converted into drug-producing structures in a process called

A. microcosm establishment

B. mibridization

C. bioremediation

D. rhizosecretion.

26. Tomatoes exhibiting delayed ripening express antisense RNA against

A. glycerol 1 phosphate acyl transferase

B. polygalactouranase

C. ACC deaminase

D. sucrose phosphate synthase gene

27. Reducing the expression of pectin methylesterase (PME) has resulted in

A. plants with resistance to bacteria and fungi

B. tomato juice that has higher viscosity

C. tomato fruit that last longer before they become rotten

D. tomato fruit that will not ripen

28. On Ti-plasmid T-region or T-DNA is flanked by a direct repeat of

A. 12 bp

B. 20 bp

C. 25 bp

D. 30 bp

29. Because of large size of Ti-plasmid, intermediate vectors (IV) are developed in which T DNA has been subcloned into

A. pBR 322 based plasmid vector

B. pRK 2013

C. pRN 3

D. all of these

30. Which of the following are used as selection marker for the cells transformed with Agrobacterium?

A. Neomycin phosphotransferase

B. Streptomycin phosphotransferase

C. Hygromycin phosphotransferase

D. any of the above

31. The technique used in animal biotechnology for the rapid multiplication and production of animals with genotype is

A. Protoplast fusion and embryo transfer

B. hybrid selection and embryo transfer

C. in vitro fertilization and embryo transfer

D. All of these

32. Which of the following microbe is widely used in the removal of industrial wastes

A. *Trichoderma Sp*

B. *Aspergillus niger*

C. *Pseudomonas Putida*

D. All of these

33. Aminopterin is used during the production of hybridoma cells because it

A. Blocks the salvage pathway

B. Prevents the growth of B cells

C. Prevents the growth of myeloma cells

D. Blocks the synthesis of Ig by B cells

34. Autonomously replicating sequences (ARS) is a characteristic feature of

A. plasmid vectors

B. phage vectors

C. E.coli vectors

D. yeast vectors.

35. A heterologous protein for its expression in the milk of a transgenic animal should be under the control of the promoter of the gene coding for

A. preproinsulin

B. Lac Z

C. β globin

D. β lactoglobulin

36. Isotope used for proving semi-conservative replication of DNA are-

A. N^{14} and P^{31}

B. N^{14} and N^{15}

C. N^{14} and C^{14}

D. C^{14} and P^{31}

37. All of the following cell types contain the enzyme telomerase which protects the length of telomeres at the end of chromosomes, except-

A. Germinal

B. Somatic

C. Haemopoetic

D. Tumour

38. The SOS repair mechanism is activated by which of the following?

A. 5- bromouracil

B. Acridine orange

C. Hydroxylamine

D. Thymidine dimers

39. DNA methylation of cytosine residues-

A. Can be induced by drugs that reactive genes

B. May contribute to long-term gene inactivation

C. Produces the promoter region that specifically bind RNA polymerase

D. Makes satellite DNA a different density so it can be separated by ultracentrifugation

40. What is the principal mutation created in bacterial genome in order to make it suitable host for the plasmid

A. lactose metabolism gene

B. Recombination/endonucleases related gene

C. Gene for selectable marker

D. Methyl transferase gene

41. Which of the following enzyme does not require a primer?

- A. RNA dependent DNA polymerase
- B. DNA dependent DNA polymerase
- C. DNA dependent RNA polymerase
- D. Taq DNA polymerase

42. Which one of the following is a common feature found in the 3' terminal segment of prokaryotic mRNAs

- A. Poly A-stretch
- B. Cap
- C. Shine-Dalgarno sequence
- D. Stem loop structure

43. Mature eukaryotic mRNAs have 5' cap that is residue of-

- A. 2-methylguanosine
- B. 3-methylguanosine
- C. 5-methylguanosine
- D. 7-methylguanosine

44. Spliceosomes mediated splicing of GU-AG intron

- A. Requires ATP
- B. Involves transesterification reaction
- C. Involves the nucleophilic attack of an OH group on the sugar phosphate backbone
- D. All of the above

45. Alternate splicing means that

- A. the same gene can code for several different proteins
- B. several different genes can code for the same protein
- C. gene expression can be regulated at the level of transcription
- D. places of DNA can be moved around within the genome

46. Which chemical is use for sanger sequencing?

- A. ddNTPs
- B. dNTPs
- C. cNTPs
- D. 5BU

Q47. What is secondary genetic code?

- A. Interaction between tRNA and corresponding amino acids
 - B. Interaction between mRNA codon and anticodon
 - C. Interaction between aminoacyl tRNA synthase and tRNA
 - D. Interaction between fmet –tRNA and AUG codon
48. A chromosome aberration leads to change in order of genes in a genetic map but does not alter its linkage group. This is due to
- A. Translocation
 - B. recombination
 - C. transposition
 - D. inversion**
49. Psychrotroph bacteria
- A. Can grow at 0-7°C, has optimum growth between 20-30°C
 - B. Can grow at 0°C and has optimum growth temperature of 10°C
 - C. Has optimum growth between 20-45°C
 - D. Can grow at 55°C or higher
50. All the following maybe the method for the inhibition of microbial growth by antibiotics except
- A. Antibiotic disrupts cell wall synthesis.
 - B. Antibiotic interfere with cell membrane function.
 - C. Antibiotics prevent the release of energy from ATP.
 - D. Antibiotic inhibits the synthesis of protein.
51. Which are the following modifications leads to protein degradation
- A. Methylation
 - B. Acetylation
 - C. Phosphorylation
 - D. Poly-ubiquitination.
52. A mutation deleting an upstream activating sequence for a single gene would be expected to be
- A. Polar
 - B. Trans-dominant
 - C. Cis-dominant
 - D. Silent
53. Heparin is an anticoagulant produced from liver. Its function is to
- A. block the conversion of Fibrinogen to Fibrin
 - B. block the conversion of Prothrombin to Thrombin
 - C. hemolyse RBC
 - D. inhibits the action of calcium ion
54. Due to continuous intake of Antibiotics, many strains of bacteria becomes resistant to antibiotics. This is because of
- A. Bacterial transformation
 - B. Bacterial transduction

- C. Conjugation
 - D. Mutation
55. . In SDS-PAGE of protein separation, one SDS molecule will binds
- A. Every amino acid
 - B. Every two amino acids
 - C. Every three amino acids
 - D. Every Four amino acids
56. Number of mitotic division required to produce 128 cell from a single cell??
- A.7 B.8 C.16 D. 32
57. The source of illumination in Fluorescent microscope is
- A. Electron beam
 - .B Light rays
 - C. UV rays
 - D. Infrared rays
58. Which of the following method is used to identify bacterial species precisely?
- A. 16S ribosomal RNA sequencing
 - B. Shine-Dalgano sequencing
 - C. 18S ribosomal RNA sequencing
 - D. Glucose utilization
59. Which m-RNA lack poly A tail?
- A. Ferritin
 - B. Interferon
 - C. Insulin
 - D. Cistron
60. Amino acid residue which is most likely to be found in the interior of water-soluble globular Proteins is
- A. Threonine
 - B. Aspartic acid
 - C. Valine
 - D. Histidine

61. Dimethyl sulfoxide (DMSO) is used as a cryopreservant for mammalian cell cultures because

- A. It is an organic solvent
- B. It easily penetrates cells
- C. It protects cells by preventing crystallization of water
- D. It is also utilized as a nutrient

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