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BIOTECH-

- 1) What extra properties does a shuttle vector possess compared to a standard cloning vector
 1. Longer multiple cloning sites
 2. Two antibiotic resistance sites
 3. Two origins of replication
 4. A promoter region

- 2) Which type of restriction enzymes are most commonly used in r-DNA technology
 1. Type I
 2. Type II
 3. Type III
 4. Type IV

- 3) The enzyme that adds nucleotide triphosphates (NTPs) at the 3' end of DNA is
 1. Alkaline phosphatase
 2. Polynucleotide kinase
 3. Terminal deoxynucleotidyl transferase
 4. Terminal deoxyphosphoryl transferase

- 4) The DNA fingerprinting pattern of a child is
 1. 100% similar to father
 2. 100% similar to mother
 3. Exactly similar to both parents
 4. 50% similar to father and rest similar to mother

- 5) Transfer of recombinant plasmid into *E. Coli* cells needs
 1. heat treatment
 2. UV rays treatment
 3. CaCl₂ treatment
 4. Lysis

- 6) The hydrogen donor in bacterial photosynthesis is
 1. Water
 2. Hydrogen sulfide
 3. Hydrogen peroxide
 4. Ammonia

- 7) The recognition of promoter regions of a gene in prokaryotes is the function of _____ subunit of RNA polymerase

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1. Alpha subunit
 2. Beta subunit
 3. Omega subunit
 4. Sigma subunit
- 8) If the gene is switched off in presence of a regulator then:
1. The gene is subjected to positive regulation
 2. The gene is subjected to negative regulation
 3. The gene is subjected to autoregulation
 4. The gene is subjected to induction
- 9) The unit used for measuring genetic linkage
1. Centimorgan
 2. Millimorgan
 3. decimorgan
 4. microMorgan
- 10) Chromosome with sub-terminal centromere is
1. acentric
 2. acrocentric
 3. metacentric
 4. telocentric
- 11) If the map distance between genes A and B is 10 map units and the map distance between genes B and C is 25 map units, what is the map distance between genes A and C?
1. 15 map units
 2. 35 map units
 3. Either 15 map units or 35 map units, depending on the order of the genes.
 4. The map distance between A and C can not be predicted from these data.
- 12) Which process will transport sodium ions to the outside of the cell and potassium ions to the inside of the cell?
1. Simple diffusion
 2. facilitated diffusion
 3. Osmosis
 4. active transport
- 13) The receptors for a group of signaling molecules known as growth factors (including growth hormone) are often
1. ligand-gated ion channels.
 2. G protein-coupled receptors.
 3. cyclic AMP.

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4. tyrosine kinase receptors.

14) Sequences that correctly describes the cell cycle is

1. G1-> G2 -> S -> mitosis -> cytokinesis ->
2. S -> G2 -> mitosis -> cytokinesis -> G1 ->
3. G1 ->S -> G2 -> cytokinesis -> mitosis ->
4. ->cytokinesis-> mitosis -> G1 -> S -> G2 ->

15) All of the following are intermolecular forces except

1. dipole-dipole interactions
2. London forces
3. covalent forces
4. van der Waals forces

16) The net yield of ATP when 18 glucose molecules are metabolized during the process of glycolysis only is:

1. 36
2. 76
3. 146
4. 216

17) The Y axis on the Lineweaver Burke plot indicates

1. V_{\max}
2. K_m/V_{\max}
3. $\frac{1}{2} V_{\max}$
4. $1/V_{\max}$

18) The fungus used in the industrial production of citric acid

1. *Rhizopus Oryzac*
2. *Fusarium moniliformae*
3. *Rhizopus nigricans*
4. *Aspergillus nigricans*

19) _____ membranes are used in separation of proteins

1. Microfiltration membranes
2. Ultrafiltration membranes
3. Reverse Osmosis membranes
4. Nanofiltration membranes

20) The immobilized enzyme produced by micro encapsulation technique provides

1. an extremely large surface area
2. smaller surface area
3. high amount of solvent
4. relatively smaller surface area

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21) Which of the following is an example of primary metabolite?

1. Antibiotics
2. Alcohols
3. Alkaloids
4. Glycosides

22) Why are white rot fungi useful for bioremediation of contaminated soil ?

1. They are all very competitive in the soil environment
2. They produce cellulases
3. They produce non-specific lignin degrading enzymes
4. They are all known to produce antibacterial antibiotics which kill antagonistic bacteria

23) Which bioreactor is used in treatment of industrial and municipal waste

1. Airlift Bioreactor
2. Packed bed Bioreactor
3. Bubble column Bioreactor
4. Membrane Bioreactor

24) Which of the following is best suited for production of virus free plants

1. Ovule culture
2. Anther culture
3. Embryo culture
4. Meristem culture

25) Baffles in the bioreactor are used for?

1. Mixing the bioreactor
2. Elimination of the vortex formation
3. Facilitation of oxygen transfer
4. Facilitation of mass transfer

26) A bioreactor has an oxygen mass transfer coefficient capability of 400 h^{-1} . What is the maximum concentration of *E. coli* that can be grown aerobically in this reactor.

Respiration rate of *E. coli* is $0.35 \text{ g O}_2 (\text{g Cell})^{-1} \text{ h}^{-1}$. Critical oxygen concentration is 0.2 mg/L . Assume oxygen saturation with air to be 6.7 mg/L .

1. 7.4 gCell/L
2. 10 gCell/L
3. 8.5 gCell/L
4. 6.2 gCell/L

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- 27) On integration into cellular genome, a bacteriophage is called as
1. Prophage
 2. Microphage
 3. Lytic virus
 4. Transducing virus
- 28) _____ is the infectious substance of prion
1. RNA
 2. DNA
 3. Glycolipid
 4. Protein
- 29) During cyclic photophosphorylation, how many pigment electrons in sulfur bacteria must get transported to produce one molecule of ATP?
1. four
 2. five
 3. three
 4. two
- 30) Postgates assay technique is used to determine the cell viability even though the organism is
1. Minute in size
 2. Killed
 3. Incapable of cell division
 4. anaerobic
- 31) Identify a micronutrient among the following
1. K
 2. Na
 3. Mn
 4. Mg
- 32) The tool for identification of motifs
1. COPIA
 2. BLAST
 3. Patternhunter
 4. RASMOL
- 33) The methyl-accepting chemotaxis proteins of bacteria
1. are directly connected to the flagellar motor to guide the bacterium
 2. can only sense conditions that are favorable for bacterial growth
 3. integrate multiple signals through a two component phospho-relay system
 4. tell the bacterium which way to go
- 34) A point mutation that changes a codon specifying an amino acid into a stop codon is called
1. Deletion mutation

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2. Frameshift mutation
3. Nonsense mutation
4. Missense mutation

35) Which among the following is not a plant derived alkaloid?

1. Nicotine
2. Codeline
3. Menthol
4. Quinine

36) Artificial seeds are

1. Zygotic embryos encapsulated in gel
2. Seeds produced in lab
3. Somatic embryos encapsulated in gel
4. Seeds encapsulated in gel

37) The fastest way to ripe tomato with tissue culture is

1. Plant organ culture
2. Anther/pollen culture
3. Protoplast culture
4. Callus culture

38) Tools to detect polymorphism in plants are _____ maps.

1. RFLP and AFLP
2. RFLP and PCR
3. RFLP and QTL
4. AFLP and PCR

39) Cybrids are

1. Nuclear hybrids
2. Cytoplasmic hybrids
3. Hybrid plants derived from cross pollination
4. Cytological hybrids

40) PRINTS software is used for

1. detection of tRNA genes
2. Identification of functional domains/motifs of proteins
3. prediction of function of a new gene
4. detection of genes from genome sequence

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41) Submission to GenBank are made using

1. BankIt and BankIt
2. Entrez
3. BankIt and Sequin
4. Sequin and BankIt

42) MAtDB is a model organism database for

1. Mouse
2. Rabbit
3. Arabidopsis
4. *Aspergillus niger*

43) Which of the following is not a potential use for results of *DNA microarray* testing?

1. To determine the genes which are active in cells affected with cancer
2. To determine the probability of an offspring carrying the gene of a particular trait
3. To determine expression of a gene
4. To determine the toxicity of a particular drug to you

44) The first successfully cloned animal is

1. Rabbit
2. Monkey
3. Sheep
4. Mouse

45) The technique used in animal biotechnology for the rapid multiplication and production of animals with a desirable genotype is

1. Protoplast fusion and embryo transfer
2. Hybrid selection and embryo transfer
3. in vitro fertilization and embryo transfer
4. in situ selection

46) For the transfer of whole individual chromosomes, they are isolated from the cells at

1. Prophase
2. Metaphase
3. Anaphase
4. Telophase

47) All of the following are Mabs except

1. Rituximab

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2. Transtuzumab
3. Infliximab
4. Tamoxifen

48) Which of the following is not the explantation technique?

1. Slide culture
2. Carrel flask culture
3. Roller test tube culture
4. Adherent primary culture

49) To prevent the accumulation of lactate

1. low glutamine concentration is required
2. high glutamine concentration is required
3. low glucose concentration is required
4. high glucose concentration is required

50) Maximum application of animal cell culture technology is in the production of

1. Interferon
2. Insulin
3. Vaccines
4. Lysine

51) _____ glycoprotein is present on each HIV particle

1. gp120
2. gp60
3. gp128
4. gp68

52) The first bioinformatics database was created by

1. Dayhoff
2. Richard Durbin
3. Pearson
4. Michael j.Dunn

53) Recombinant fusion proteins are purified in large scale commonly by

1. Ion exchange chromatography
2. Column chromatography
3. Affinity chromatography
4. Gel filtration chromatography

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54) The yield Coefficient Y_{XS} is calculated using formula

1. dX/dt
2. dS/dt
3. dX/dS
4. dX/x_0dt

55) The first transposable elements discovered by Barbara McClintock

1. Ac-Dc elements
2. Ty elements
3. Alu elements
4. P-elements

56) Pyrosequencing is especially useful for

1. Sequencing repetitive DNA regions in multiple individuals
2. Sequencing highly condensed DNA regions
3. Sequencing short DNA regions in multiple individuals
4. Sequencing DNA regions with high AT content

57) In a cross of a round hybrid pea with a true breeding round parent ($Ww \times WW$), what genotypic proportions would be observed in the offspring?

1. Half heterozygous, half homozygous dominant
2. Half round, half wrinkled
3. All heterozygous
4. All round

58) How many Recombination signal sequences are attached to the D gene segment of variable chain of heavy chain

1. One
2. Two
3. Three
4. Four

59) Exogenous antigens are processed by _____ pathway.

1. Cytosolic pathway
2. Endogenous pathway
3. External pathway
4. Cytoplasmic pathway

60) All of the following are auto immune disorders except

1. SCID
2. Rheumatoid Arthritis
3. Grave's disease
4. Addisons disease

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key

A-1, B-2, C-3, D-4 Numbers represents the alphabet.

| | | | | | |
|-----|---|-----|---|-----|---|
| 1. | 3 | 21. | 2 | 41. | 3 |
| 2. | 2 | 22. | 3 | 42. | 3 |
| 3. | 3 | 23. | 4 | 43. | 2 |
| 4. | 4 | 24. | 4 | 44. | 3 |
| 5. | 3 | 25. | 2 | 45. | 3 |
| 6. | 2 | 26. | 1 | 46. | 2 |
| 7. | 4 | 27. | 1 | 47. | 4 |
| 8. | 2 | 28. | 4 | 48. | 4 |
| 9. | 1 | 29. | 3 | 49. | 3 |
| 10. | 2 | 30. | 3 | 50. | 3 |
| 11. | 3 | 31. | 3 | 51. | 1 |
| 12. | 4 | 32. | 1 | 52. | 1 |
| 13. | 4 | 33. | 3 | 53. | 3 |
| 14. | 2 | 34. | 3 | 54. | 3 |
| 15. | 3 | 35. | 3 | 55. | 1 |
| 16. | 1 | 36. | 3 | 56. | 3 |
| 17. | 4 | 37. | 1 | 57. | 1 |
| 18. | 4 | 38. | 1 | 58. | 2 |
| 19. | 2 | 39. | 2 | 59. | 2 |
| 20. | 1 | 40. | 2 | 60. | 1 |