

Central Board of School Education

Marking Scheme 2016

[Official]

Marking Scheme for Biotechnology (045) Class XII

Paper 99/1

Section A

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|--|-----------|
| 1. Artemisin, Berberine etc. from table 1, as on page 118, any two. | 0.5 + 0.5 |
| 2. Monoclonal antibody/ used for early stage breast cancer therapy. | 1 |
| 3. 3. Viable plate count/ absorbance using spectrophotometer, any one. | 1 |
| 4. Double stranded primer will anneal to itself, not to target DNA. | 1 |
| 5. Specific activity increases with protein purity. | 1 |
| 6. The size of insert decides type of vector. | 1 |

Section B

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|--|---------------------|---|
| 7. Monoclonal antibodies block T-cell function. Otherwise these cells will play a major role in graft rejection. | 1 + 1 | |
| 8. Any two of the following- Recombinant protein not secreted into medium, incorrect folding and hence inactive, insoluble inclusion bodies. | 1 + 1 | |
| 9. Any two as indicated on pg. 60. | 1 + 1 | |
| 10. Fig.5, pg. 91. | 2 | |
| 11. Animal cells do not have cell walls and hence are fragile. | 1 | |
| Antibiotics added to prevent contamination from fast growing bacteria/fungi. | 1 | |
| 12. Any two- maintain pH around 7.4, proper aeration using shakers, sterilized medium, addition of antifoaming agent. | 1 + 1 | |
| 13. Osmolality preserves membrane integrity; has significant effect on cell growth and function. | 1 + 1 | |
| 14. Genomic library | cDNA library | |
| Whole DNA included | Expressed mRNA used | 1 |
| Large in size | smaller in size | 1 |

Section C

15. Totipotency. 1
Any two applications in plant cell culture chapter 1 + 1
16. Vectors are vehicles to carry foreign DNA into suitable hosts in RDT. 1
Features essential- self replicating (origin of replication), selectable marker, unique restriction sites and preferably small in size. 0.5 x 4
17. (a) Strain preservation
(b) To solidify medium
(c) mutagenic agent
(d) cryoprotectant 0.5 x 4
These centers maintain and are resource centres for all microbial strains deposited. 1
18. (a) Anchorage dependant cells grown as adherent cells and are derived from tissues and organs like kidney, liver etc. Anchorage independent cells are grown in suspension cultures like cells derived from blood etc. 2
(b) Cryoprotectants such as DMSO/glycerol 10%/serum 90% have to be added. 1
19. Producing pharmaceutical products using genetically modified plants and animals. 1
Expressing recombinant proteins in milk- all four listed as on pg.39. 0.5 x 4
20. Epitopes are amino acid sequences that stimulate immune response. 1
Any two reasons- optimal design/ scope for manipulation/unhindered supply/ safety. 1 + 1
21. Aqueous two-phase partition details with diagram on pg. 42 3
OR
Detection of Sickle Cell Anaemia by observation of RBC under microscope 1
Confirmation by peptide mapping- procedure on pgs. 36-37 2
22. Primary metabolites used in basic metabolism such as glucose etc. 1
Secondary metabolites are additional plant products derived from primary metabolites. 1
Play role in defence, any one as on pg. 118, table. 1 1
23. Any 3 as listed on pg. 121 1 x 3
24. Margaret O.Dayhoff pioneered development of computer methods for comparing protein sequences. Any two others from pg. 72-73. 1 + 2
25. (a)Blunt ends, Alu I details on pg.6; (b)Sticky ends, Eco RI on pg.6 or any other. 1 + 1
Sticky or cohesive ends are self annealing and easier to ligate in making recombinant vectors. 1

Section D

26. Biological value measures amount of protein nitrogen that is retained by the body to amount of given protein consumed. 1
 BCAA released from skeletal muscle can be used as fuel, nitrogen source to make alanine and reduce mass and hence ingested BCAAs protect and preserve muscle mass of athletes, maintain exercise performance and delaying exhaustion. 4
- OR**
- Any one property- solvent tolerance/pH tolerance/catalytic potency. 1
 Example of subtilisin as on pg. 52. 4
27. Principle of Sanger's method as on pg. 23. 2
 Method as on pg.24- 26. 3
28. Proteomics is the large scale study of the proteome which is the complete set of proteins in a given cell. 1
 Three types as on diagram and on pg. 70-71. 3
 Post transcriptional and post translational modifications lead to larger no. of proteins compared to their genes. 1

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