



Note : 1. All questions are compulsory.

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| 1. | Explain the events of protein engineering in detail. | 16 |
| OR | | |
| | a) Discuss processing of recombinant proteins. | 8 |
| | b) Discuss enzymes involved in PCR. | 8 |
| 2. | Explain gene therapy along with its advantages. | 16 |
| OR | | |
| | a) Discuss the production of monoclonal antibodies by phage display technique. | 8 |
| | b) Discuss gene therapy for human diseases. | 8 |
| 3. | Explain the role of rDNA technology in production of alcohol. | 16 |
| OR | | |
| | a) Discuss the role of r-DNA technology in production of vitamin B-12. | 8 |
| | b) Discuss the role of r-DNA technology in production of polio vaccine. | 8 |
| 4. | Discuss concept of nanobiotechnology and its application. | 16 |
| OR | | |
| | a) Write principle and application of greenhouse technology. | 8 |
| | b) Discuss the concept of biodegradable plastic. | 8 |
| 5. | All compulsory. | |
| | a) Write a note on expression vectors. | 4 |
| | b) Write a note on herpes virus vectors. | 4 |
| | c) Draw flow sheet diagram for production of penicillin by r-DNA technology. | 4 |
| | d) Write a note on plant secondary metabolite. | 4 |
