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**B PHARM**  
**(SEM VI) THEORY EXAMINATION 2022-23**  
**PHARMACEUTICAL BIOTECHNOLOGY**

*Time: 3 Hours*

*Total Marks: 75*

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

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**SECTION A**

- 1. Attempt all questions in brief. 10 x 2 = 20**
- Explain role of catalase and peroxidase enzymes.
  - What is protein engineering.
  - Define vectors along with two examples. <https://pharmacyindia.co.in/>
  - What do you mean by PCR.
  - Define cellular and humoral immunity.
  - Define monoclonal antibodies.
  - Explain mutation and mutagens with examples.
  - Explain ELISA. <https://pharmacyindia.co.in/>
  - Define fermenter and their types.
  - Write name of any two microorganisms used in production of citric acid.

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**SECTION B**

- 2. Attempt any two parts of the following: 2 x 10 = 20**
- Explain biosensors and their types along with applications.
  - Explain in detail about production and purification of monoclonal antibodies by hybridoma technology.
  - Explain in detail PCR and its applications.

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**SECTION C**

- 3. Attempt any five parts of the following: 5 x 7 = 35**
- Explain scope and application of pharmaceutical biotechnology.
  - Write in detail different methods of enzyme immobilization.
  - Write in detail the method of preparation of insulin by recombinant DNA technology.
  - Differentiate between prokaryotes and eukaryotes.
  - Explain the production of vitamin B12 by fermentation. <https://pharmacyindia.co.in/>
  - Explain general method of preparation and storage of bacterial vaccines.
  - Explain different types of hypersensitivity reactions with example.