

(6 pages)

Reg. No. : .....

Code No. : 30730 E      Sub. Code : ESM 141

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

Fourth Semester

Microbiology

Skill Enhancement Course – VACCINE  
TECHNOLOGY

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following MHC complex activates helper cells?
- (a) MHC I                      (b) MHC II  
(c) both (a) and (b)        (d) None of these

2. Exogenous supply of antibodies provides which of the following types of immunities?
- (a) Artificial Active Immunity  
(b) Natural Active Immunity  
(c) Active immunity  
(d) Passive Immunity
3. Which of the following is the first approved malaria vaccine?
- (a) BCG vaccine  
(b) Mosquirix  
(c) IPV  
(d) OPV
4. \_\_\_\_\_ is an example of live attenuated bacterial vaccine.
- (a) typhoid                      (b) corona  
(c) malaria                      (d) rabies
5. \_\_\_\_\_ is a substance that increases the immune response to a vaccine.
- (a) toxoid                      (b) adjuvant  
(c) hapten                      (d) epitope

6. Which technology is used to introduce vaccine antigens into plants?
  - (a) CR1 SPR-Cas 9
  - (b) Agrobacteri un-mediated transformation
  - (c) Polymerase chain reaction (PCR)
  - (d) Viral attenuation
7. What is the primary goal of rational vaccine design?
  - (a) Using trial-and-error methods to create vaccines
  - (b) Designing vaccines based on molecular and immunological understanding
  - (c) Producing vaccines only through live attenuated methods
  - (d) Eliminating the need for adjuvants in vaccine
8. Which type of immune response is primarily studied in T-cell expression cloning?
  - (a) Innate immunity
  - (b) B-cell antibody production
  - (c) T-cell mediated community
  - (d) Complement activation
9. Which vaccine additive is used as a preservative to prevent bacterial and fungal contamination?
  - (a) Polysorbate 80
  - (b) Formaldehyde
  - (c) Thimerosal
  - (d) Aluminum hydroxide
10. Which of the following is an example of a stabilizer used in vaccines?
  - (a) Aluminum phosphate
  - (b) Gelatin
  - (c) Formaldehyde
  - (d) Ethanol

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Explain the role of epitopes in short.  
Or  
(b) What is active immunization? Explain.
12. (a) How are vaccines for malaria prepared?  
Or  
(b) Justify why a vaccine should be licensed.

13. (a) Outline the advancements in tuberculosis vaccine.

Or

- (b) Build a short note on the properties of adjuvants.

14. (a) Discuss the fundamental research done in designing a rational vaccine.

Or

- (b) Summarize the different methods followed in antigen delivery.

15. (a) What is the role of animal testing in vaccine development?

Or

- (b) Compile a short note on vaccine additives.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe a detailed note on the history of vaccination.

Or

- (b) Justify the importance of immunization through passive immunization.

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17. (a) Elaborate on the preparation of live attenuated vaccines.

Or

- (b) Illustrate how bacterial vaccines are prepared.

18. (a) Classify peptide and conjugate vaccines.

Or

- (b) Discuss how vaccines are prepared from plants.

19. (a) Interpret the T cell expression cloning method in identifying an antigen.

Or

- (b) Report the different methods of antigen identification.

20. (a) Summarize a detailed note on the quality control and regulations in vaccine research.

Or

- (b) List out the regulations followed for vaccines in developing countries.

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