



Name: ..... Roll No.: .....

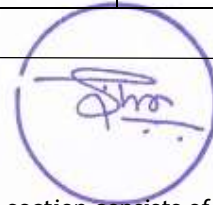
Branch: ..... Signature of Invigilator: .....

Semester: IVth Date: 28/04/2022 (MORNING)

Subject with Code: BE208 BIOLOGY OF IMMUNE SYSTEM

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE



1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. Candidates should write their roll no. in each page of the booklet.
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to submit the question paper cum answer sheets before leaving the examination hall.

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: BE**  
**BRANCH: Biotechnology**

**SEMESTER : IV**  
**SESSION : SP/22**

**SUBJECT: BE208 Biology of Immune System**

**TIME: 3 hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 2 sections- section A (30 marks) and Section B (20 Marks)
  2. Section B contains 15 questions. Candidates may attempt any 10 questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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**Section A (30X1=30)**

Multiple choice questions:

1. Skin is a \_\_\_\_\_ barrier.  
a. anatomical                      b. physiological                      c. phagocytic                      d. inflammatory
2. Which of the following is anti-viral?  
a. lysozyme                      b. interferon                      c. protein                      d. Hormone
3. Histamine is secreted by  
a. Epithelial cell                      b. Mast cells                      c. Red blood cells                      d. White blood cells
4. Humoral immunity consists of  
a. normal cells                      b. pathological cells  
c. cytotoxic cells                      d. immunoglobulin molecules
5. Which antibody characterizes the allergic reaction  
a. IgG                      b. IgA                      c. IgM                      d. IgE
6. Which of the following secretes immunoglobulin  
a. T-lymphocyte                      b. B-lymphocyte                      c. Macrophage                      d. Mast cells
7. IgA...  
A. crosses the placenta                      B. is involved in hay fever  
C. activates complement via the classical pathway                      D. is present in milk and saliva
8. Western blots are primarily used to detect:  
a. protein                      b. carbohydrate                      c. lipid                      d. RNA
9. In an ELISA you might use an antigen or antibody labeled with  
a. FITC                      b. Colloidal gold                      c. Europium 3<sup>+</sup>                      d. Horseradish
10. HAT medium is used to  
a. Immortalize B-lymphocytes                      b. Select for hybrids in the hybridoma technique  
c. Culture B-lymphocytes                      d. Kill B-cell Hybridoma
11. Which of the following immunoglobulins is present normally in plasma at the highest concentration?  
a. IgG                      b. IgM                      c. IgA                      d. IgD

12. One principal function of complement is to
- mediate the release of histamine
  - Bind antibodies attached to cell surfaces and to lyse these cells
  - phagocytize antigens
  - cross link allergens
13. Which of the following sets of immunoglobulin classes ALL have hinge regions:
- IgD, IgE and IgG
  - IgA, IgE and IgG
  - IgA, IgD, and IgM
  - IgA, IgD and IgG
14. SCID can occur due to the absence of an enzyme ?
- Adenosine deaminase
  - Guanosine deaminase
  - Phosphorylase
  - Thymidine deaminase
15. Which of the following is considered an autoimmune disease?
- rheumatoid arthritis
  - AIDS
  - SCID
  - agammaglobulinemia
16. CD4 T cells are generally restricted by
- CD-1
  - MHC class –I
  - MHC class-II
  - $\beta$ 2 microglobulin
17. Example of live attenuated vaccine
- Polio
  - Anthrax
  - Rabies
  - Hepatitis
18. Which of the following confer(s) passive immunity
- MMR vaccine
  - Hepatitis B immunoglobulin
  - Infection with measles virus
  - Cross placental transfer of maternal antibodies
19. Which of the following cell types is not considered a professional antigen-presenting cell?
- macrophage
  - neutrophil
  - B cell
  - dendritic cell
20. A living microbe with reduced virulence that is used for vaccination is considered:
- Dormant
  - Virulent
  - Attenuated
  - Denatured
21. The classical and alternative pathways meet at complement component:
- C3
  - C4
  - C4b
  - C5
22. The site of B cell development in mammals is:
- the bursa of Fabricius
  - the thymus
  - the bone marrow
  - the lymph nodes
23. Which of the following is the most abundant immunoglobulin?
- IgA
  - IgG
  - IgM
  - IgD
24. The double diffusion method allows for disease identification and diagnosis and is an application of what immunological technique?
- agglutination
  - precipitation
  - immunoassay
  - complement fixation
25. Type IV hypersensitivity is also called as
- immediate hypersensitivity
  - delayed hypersensitivity
  - cytotoxic hypersensitivity
  - immune complex hypersensitivity
26. ELISA test when compared to western blot technique is
- Less Sensitive, less Specific
  - More Sensitive, More specific
  - Less Sensitive, more specific
  - More Sensitive, less Specific
27. Agglutination reaction is more sensitive than precipitation for the detection of
- antigens
  - antibodies
  - complement
  - antigen-antibody complexes
28. In which of the following case a large lattice is formed?
- Antibody is in excess
  - Antigens and antibodies are in optimal proportion
  - Antigen is in excess
  - None of these

29. Rocket Immunodiffusion is also known as  
a. gel diffusion                      b. electroimmunodiffusion                      c. double-diffusion                      d. none of these
30. The class of an immunoglobulin is determined by  
A. the variable region                      B. the J-chain                      C. the heavy chain                      D. the carbohydrate

**Section B**

**Answer any 10 questions:**

**(2X10= 20)**

1. Give the different components of immune system.
2. Differentiate between active immunity and passive immunity.
3. Write a short note on Hybridoma technology.
4. What are abzymes?
5. With the help of neat and labeled diagram discuss the structure of typical antibody.
6. With the help of a neat diagram differentiate between MHC class I and MHC class II.
7. What do you mean by subunit vaccine or DNA vaccine or live attenuated vaccine or inactivated vaccine?
8. What is transplantation? Why is transplantation of eye very easy?
9. Write a short note on SCID or AIDS or Digeorge syndrome.
10. Define: Opsonization, complement fixation, agglutination, precipitation
11. Differentiate between innate immunity and acquired immunity.
12. Give a comparative table for the five types of antibodies.
13. What do you mean by first generation and third generation vaccine?
14. Discuss the different types of grafts used in transplantation.
15. Define autoimmunity. Give examples of autoimmunolgical diseases.

**.....28/04/2022 M:.....**