

**MS in Microbiology Final Exam 2025 (July-December)**  
**Department of Microbiology and Veterinary Public Health**  
**Chattogram Veterinary and Animal Sciences University**  
**Course: Molecular Microbiology (MMB-602)**  
**Full Mark: 40**  
**Answer any four (04) questions. Time 2 hours**

- Q1 (a)** Why are bacteria commonly used for cell function studies? 05  
**(b)** Name the model organism in the field of study of  
a) Prokaryotes  
b) Single-cell eukaryotes  
c) Multi-cell eukaryotes  
d) Vertebrate  
e) Plant 05
- Q2 (a)** Is there a directionality in DNA? Give a justification of your answer. 05  
**(b)** Illustrate the fate of introns during transcription in prokaryotes and eukaryotes. 05
- Q3** Define and illustrate the following segments of a gene: ORF, CDS, UTR, Promoter region, and non-coding DNA. 10
- Q4 (a)** List different sequencing technologies. Briefly explain the different steps in the next-generation sequencing (NGS) technology. 05  
**(b)** What is contig? Mention types of sequence data assembly. 05
- Q5 (a)** Classify the typing of microbes. Enlist band-based typing methods used in Clinical Microbiology. 05  
**(b)** What is a k-mer? Name the tools used for the detection of bacterial species, sequence type (ST) and antimicrobial resistance genes based on sequence data. 05

# **Chattogram Veterinary and Animal Sciences University**

MS in Microbiology

July- December 2025

Subject: Advanced Immunology and Serology

Course code: AIS 602

Total marks: 40, Time: 2 hours

Answer any **four (4)** questions.

- |    |   |                                                                                                                                                         |       |
|----|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1. | a | Differentiate innate and adaptive immunity.                                                                                                             | 3.0   |
|    | b | Name the phagocytic cell. Name the enzymes contained by the granules of neutrophil.                                                                     | 3.0   |
|    | c | Mention the PRR and corresponding PAMP molecules in neutrophil.                                                                                         | 2.0   |
|    | d | What is the mechanism of by which circulating neutrophil comes to the site of infection?                                                                | 2.0   |
| 2. | a | Define complement and its role in the body. Explain classical and lectin pathway of complement activation with figure.                                  | 10.0  |
| 3. | a | What is hybridoma? Explain the procedure of production of monoclonal antibody. Mention the uses of monoclonal antibody.                                 | 1+7+2 |
| 4. | a | Give a proof that extracellular antigen is presented to CD4+ and intracellular antigen is presented to CD8+ cell and antigen processing requires times. | 5+5   |
| 5. | a | Discuss autoimmune disease.                                                                                                                             | 10.0  |

**Chattogram Veterinary and Animal Sciences University**  
**MS in Microbiology Final Examination**  
**July-December Semester 2025**  
**Course Title: Advanced Systemic Bacteriology**  
**Course Code: ASB 602**  
**Total Marks: 40      Time: 2 hours**

Figures in the right margin indicate full marks. Answer any four questions.

1. a) State the general features of *Actinomyces*, *Nocardia*, *Trueperella* and *Dermatophilus* species of veterinary importance. 4  
b) Give a summary of the hosts and diseases caused by pathogenic clostridia. 3+3  
Write down the features of the neurotoxins of *Clostridium botulinum* and *Clostridium tetani*.
2. a) List the molecular techniques for the detection and strain typing of *Staphylococcus pseudintermedius*. Describe the virulence factors of *Staphylococcus* species that can cause diseases in dogs and cats. 2+4  
b) Explain the mode of action of anthrax toxin. 4
3. a) Classify *Salmonella* serotypes on the basis of host range. Describe the antigens used for *Salmonella* serotyping. 2+4  
b) Write down the morphological and growth characteristics of *Pseudomonas aeruginosa* and *Enterococcus faecalis*. 4
4. a) Name the samples that should be collected for the diagnosis of bovine brucellosis and write down the sequential steps need to be followed for laboratory confirmation of the disease. 5  
b) Describe the major virulence factors of pathogenic *Escherichia coli* in animals. 5
5. a) Enumerate the serovars of *Leptospira* which cause leptospirosis in domestic animals. Give a summary of the specimens and laboratory tests for the diagnosis of leptospirosis. 3+3  
b) Describe the etiologic agents associated with wooden tongue and pyelonephritis in cattle. 4

# **Chittagong Veterinary and Animal Sciences University**

MS in Microbiology and Veterinary Public Health  
July – December 2025 Semester Final Examination

Course title: Vaccinology

Course Code: VCL- 602

Full Marks- 40, Time- 2 Hours

Answer **any four** questions; Figures in the right margin indicate full marks.

1. a) Define vaccine. Describe the methods employed for attenuation of living organisms. 5  
  
b) Briefly outline the advantages and disadvantages of recombinant vaccines and DNA vaccines. 5
2. a) Describe the combined vaccines with examples in dogs and cats. Enlist vaccines for cattle and poultry. 5  
  
b) What do you mean by the purity, safety, and stability of a vaccine? Write down the importance of the interference test, the increase in virulence test, and the efficacy test for different vaccines. 5
3. a) Briefly describe the procedure of FMD vaccine production. 7  
  
b) Define Master seed. Write down the characteristics of seed lot in Anthrax vaccine production. 3
4. a) Briefly explain the causes of vaccination failure. 5  
  
b) Write down the importance of production facilities and record keeping during the process of vaccine production. 5
5. Write short note on **any four** – 2.5×4=10
  - i) Principles of vaccination
  - ii) Diva Vaccine
  - iii) New approaches to vaccine development
  - iv) Autogenous vaccine
  - v) Biotechnology-derived vaccines



Chattogram Veterinary and Animal Sciences University

MS in Microbiology; July – December Semester, 2025

Course Title: Avian Microbes; Course code: AMB-602

Full Marks:40; Time: 2 hours

Answer any Four (4) Questions

1. Enlist the diseases and disease conditions in poultry attributed to Gram positive bacterial pathogens. Mention the virulence factors of *Staphylococcus* species that can cause diseases in poultry. How can you differentiate arthritis in poultry caused by *Staphylococcus aureus* and *Pasteurella multocida*? 10
2. What would be the best way of sampling for the determination of non-typhoidal *Salmonella* status in a poultry flock? How can you confirm an acute colisepticemia outbreak in a poultry flock? Explain the antigenic formula 1,4,5,12:i:1,2 of a *Salmonella enterica* serotype Typhimurium strain. 10
3. Write down the process of isolation of *Mycoplasma gallsepticum* from a live bird clinically affected with the organism. What is the morphological basis of sub-typing of avian influenza viruses and how a highly pathogenic avian influenza virus is differentiated from a low pathogenic avian influenza virus? 10
4. What are the pathotypes of Newcastle disease virus? Enlist functions of the genes of Newcastle disease virus. What is the molecular basis behind the emergence of a new serotype of infectious bronchitis virus? What should be the ideal vaccination strategy to control infectious bronchitis affecting poultry in Bangladesh? 10
5. Compared with avian influenza virus or Newcastle disease virus, why infectious bursal disease virus is more tolerant to adverse environmental conditions and chemical treatments? Describe the aetiologies of duck plague and duck viral hepatitis. How the diseases caused by them in ducks can be controlled and prevented? 10

**Chattogram Veterinary and Animal Sciences University**

Department of Microbiology and Veterinary Public Health

MS in Microbiology; July-December Semester, 2025

Subject: Advanced Systemic Virology, Course code: ASV-602

Total Marks: 40; Time: 2 hours

**(Figures in the right margin indicate full marks. Answer any four questions)**

- 1 a. List the virus families under each Baltimore group with suitable examples. What is the replication strategy of viruses under group 5 in Baltimore classification? 3+2  
b. State the virus family and clinical symptoms of FIP in cats. Write the cultivation procedures of Infectious bronchitis in chickens. 2+3
- 2 a. Write down the physiochemical properties of Picornaviridae? How FMD virus bind to the host cell receptor? 3+2  
b. State the clinical signs of Inclusion Body Hepatitis (IBH) in chickens. Differentiate between Feline panleukopenia virus and Canine parvovirus. 2+3
- 3 a. Mention the specific receptor site of the EDS virus on the host cell. Explain the genetic shift and drift in Avian influenza virus. 1+4  
b. Explain in detail the diagnostic and cultivation procedures for AIV in chicken 5
- 4 a. What is HEP and LEP in rabies vaccination? Write the name of 5 viruses that attack the nervous system. 2+2  
b. What measures you can take to prevent and control Dengue and Nipah viral outbreak in Bangladesh? 6
- 5 Write short notes on following (any two): 5+5
  - a. West Nile virus
  - b. Chikungunya virus
  - c. Monkey pox virus