

Chattogram Veterinary and Animal Sciences University  
MS in Microbiology  
July- December 2021  
Subject: Advanced Immunology and Serology  
Course code: AIS 602  
Total marks: 40  
Time: 2 hours

- |   |   |  |      |
|---|---|--|------|
| 1 | a | What do you mean by autoimmunity? Classify different types of autoimmune disease.          | 3.0  |
|   | b | Explain different types of autoimmune diseases.  | 7.0  |
| 2 | a | Define hypersensitivity? What are the basis of different types of hypersensitivity?        | 3.0  |
|   | b | Differentiate Arthus reaction versus allergy   | 3.0  |
|   | c | Explain the mechanism of type IV hypersensitivity  | 4.0  |
| 3 | a | Give proof that time, co-stimulator are needed for immune response in case of T lymphocyte | 4.0  |
|   | b | Explain intracellular antigen processing with diagram                                      | 6.0  |
| 4 | a | Define complement. Explain different types of complement activation process                | 10.0 |
| 5 | a | Mention contribution 10 Nobel laureate scientists in the field of Immunology               | 10.0 |

Chittagong Veterinary and Animal Sciences University  
MS in Microbiology Final Examination  
July – Dec Semester 2020  
Course title: Advanced Systemic Virology  
Course Code: ASV- 602  
Full Marks- 40, Time- 2 Hours

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

1. Write down the Baltimore classification of the virus. Enlist important families of virus in each class, mentioning their nucleic acid type, envelop, site of replication and symmetry. 10
2. a) Differentiate between antigenic drift and antigenic shift. 3  
b) List the genomic segments of Avian influenza (AI) virus, encoded proteins, and their functions. 3  
c) Briefly describe the physiochemical properties, lab diagnosis, and control of HPAI virus. 4
3. a) Enlist viruses and associated diseases belonging to Paramyxoviridae family. 3  
b) Write down the physiochemical properties, mode of transmission and replication and control of Rabies virus. 5  
c) How can you cultivate chicken infectious anemia virus? 2
4. a) Describe in brief the genome properties, replication, and diagnosis of FMD virus. 4  
b) State important members of Coronaviridae family with their diseases. 3  
c) Enlist major coronaviral structural proteins with their functions. 3
5. Write short note on any two- 5×2  
I) Canine parvo virus =10  
II) Nipah virus  
III) MERS-CoV

**Chattogram Veterinary and Animal Sciences University**  
**Department of Microbiology and Veterinary Public Health**  
**MS in Microbiology, July-December 2020**

**Subject: Molecular Microbiology; Course Code: MMB-602**

**Total Marks: 40; Time: 2 hours**

(Figure of the right margin indicates full marks. Answer any four questions)

- |   |  |     |
|---|--|-----|
| 1 | a) Define nucleic acid hybridization. Write down the difference between southern blot and northern blot techniques.  | 4   |
|   | b) Briefly explain the C Value Paradox.  | 3   |
|   | c) What is promoter region? Write down the importance of CpG islands.  | 3   |
| 2 | a) Why introns are removing from genes before protein synthesis?   | 2   |
|   | b) What are the principle characteristics you will follow before typing of microorganisms? Mention the sequence based typing methods for bacteria and viruses. | 4   |
|   | c) Enlist restriction endonuclease enzymes with their recognition site and types of ends generated during DNA modification.                                    | 4   |
| 3 | a) Sketch; How does DNA ligase join the two DNA fragments?   | 4   |
|   | b) Define primer. Write down the properties of good primer.  | 3   |
|   | c) What is DNA sequencer? Enlist different modern methods used for DNA sequencing.   | 3   |
| 4 | a) Why is primer designing/selection a crucial part of successful PCR? What are the secondary structures that you will avoid during primer designing?          | 4   |
|   | b) Define metagenomics. Briefly describe the Maxam-Gilbert sequencing technique.   | 6   |
| 5 | a) What is a cell lysate? Illustrate the affinity chromatography extraction method for obtaining eukaryotic mRNA molecules.                                    | 6   |
|   | b) Write down the following short note:  | 2×  |
|   | I. Gene knockout   | 2=4 |
|   | II. DNA Finger print   |     |

**Chattogram Veterinary and Animal Sciences University**  
**Department of Microbiology and Veterinary Public Health**

**MS in Microbiology; July-December 2020**

**Subject: Vaccinology; Course Code: VCL-602**

**Total Marks: 40; Time: 2 hours**

(Figure of the right margin indicates full marks. Answer any four questions)

- |   |   |      |
|---|---|------|
| 1 | a) Write down the historical events of ten scientists in the field of Vaccinology.  | 5    |
|   | b) Define autogenous vaccine. Appraise the mode of action and application of autogenous vaccines in the veterinary sector with suitable examples.   | 5    |
| 2 | a) Attenuation or inactivation of wild strains of a pathogen is a fundamental prerequisite for vaccine preparation. What strategies will you employ in order to create a live vaccine from a virulent wild-strain virus?  | 7    |
|   | b) Sketch the mechanisms of action of common adjuvants.   | 3    |
| 3 | a) Which variants are currently used for anthrax vaccine preparation? Describe the anthrax vaccine manufacturing process in brief.  | 8    |
|   | b) Tabulate the vaccination schedule of pet dogs.   | 2    |
| 4 | a) Suppose a layer flock was vaccinated with the NDV vaccine. Fourteen days later, you will perform an HI test and find that few birds show low antibody titers, but the majority of birds fail to produce antibody. Explain your opinion on the flock's immune status and find out the possible related reasons. | 5    |
|   | b) Define toxoid vaccine with examples. Write down the difference between mRNA vaccines and DNA vaccines.   | 5    |
| 5 | a) Briefly describe the different routes of injectable vaccines with relative advantages and disadvantages.   | 5    |
|   | b) Write down the following short note:   | 2.5  |
|   | I. Marker vaccines  | ×    |
|   | II. Modern approaches and technology are used for vaccine production.   | 2= 5 |

Chattogram Veterinary and Animal Sciences University

MS in Microbiology Final Examination; July-December Semester, 2020

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

Full Marks: 40; Time – 2 hours

Answer any 4 (FOUR) questions

1. List Gram positive bacterial pathogens along with the diseases they cause in avian species. Describe the procedures for laboratory diagnosis of necrotic enteritis in poultry. 10
2. Write down the morphological and growth characteristics of *Pasteurella multocida*. What are the samples you should choose for the diagnosis of: i) acute fowl cholera and ii) infectious coryza? What are the factors correlated with the virulence of *Escherichia coli* in avian species? 10
3. Why is it so difficult to prepare an effective vaccine against colibacillosis in poultry? Describe the technique of boot-swabbing for screening *Salmonella* in a poultry farm. Write in brief the development cycle of *Chlamydophila psittaci*. 10
4. What are the criteria based on which a highly pathogenic avian influenza virus is differentiated from a low pathogenic avian influenza virus. How is a clade of highly pathogenic avian influenza A virus subtype H5N1 defined? 10
5. Name the samples that should be collected for the diagnosis of Newcastle disease in avian species, and write down the sequential steps need to be followed for laboratory confirmation of the disease from the samples collected. What is the basis of evolution of new serotypes in infectious bronchitis virus of chickens? 10

**Chattogram Veterinary and Animal Sciences University**

**MS in Microbiology Final Examination**

**July-December Semester, 2020**

**Course Title: Advanced Systemic Bacteriology**

**Course Code: ASB 602**

**Total Marks: 40**

**Time: 2 hours**

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

1. Why *Pseudomonas aeruginosa* is highly resistant to multiple antimicrobial agents? Write down the major virulence factors of pathogenic *Escherichia coli* in animals. Give an overview of phenotypic and genotypic techniques currently used for typing *Salmonella*. 2+5+3
2. Enumerate bacterial pathogens frequently isolated from cows with clinical mastitis. Describe the main characteristics of the toxins produced by *Bacillus anthracis*. Write down the disease conditions of farm animals in which *Fusobacterium necrophorum* plays a primary role. 2+5+3
3. Describe the laboratory procedures for the isolation and identification of etiological agent of haemorrhagic septicaemia in buffaloes. Illustrate the progression of infection with *Brucella abortus* in mature susceptible cattle. Summarize the tests commonly used for the diagnosis of bovine brucellosis using milk or serum. 4+4+2
4. State the morphological and cultural characteristics of actinobacteria of veterinary importance. Identify the possible consequences of *Mycobacterium bovis* infection in cattle acquired via aerosols. Write down the biological activities of the toxins produced by *Clostridium perfringens*. 3+4+3
5. How will you isolate, identify and characterize *Staphylococcus pseudintermedius*? What are the main differences between the genera *Leptospira*, *Brachyspira* and *Borrelia*? Summarize the laboratory procedures for the diagnosis of leptospirosis. 4+3+3