

Chattogram Veterinary and Animal Sciences University
MS in Microbiology Final Examination
July-December Semester, 2021
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. List the procedures used for conventional laboratory differentiation of the streptococci. Describe the general functions of the major virulence determinants of pathogenic staphylococci of veterinary importance. Make a flowchart outlining the rapid identification of the most clinically significant *Staphylococcus* species. 1+5+4

2. Name the neurological diseases caused by bacterial pathogens which elaborate toxins affecting neurological functions. How will you identify *Clostridium perfringens* toxins in ileal contents from a recently dead animal? Describe the major virulence determinants of *Bacillus anthracis* associated with plasmids. 1+5+4

3. State the general characteristics of the genera *Truuperella*, *Pseudomonas*, *Haemophilus* and *Brucella*. Describe the laboratory procedures for the diagnosis of listeriosis in ruminants. Write down the clinical manifestations of *Erysipelothrix rhusiopathiae* infection in domestic animals. 4+4+2

4. Describe the cellular products produced by *Mannheimia haemolytica*. How will you differentiate this pathogen from *Pasteurella multocida*? Outline the procedure for the isolation, identification, and characterization of *Campylobacter jejuni* from poultry. 2+2+6

5. Enumerate the bacterial pathogens implicated in postpartum metritis in cattle. Explain the antigenic characteristics of *Salmonella*. Give a summary of routine isolation methods for the detection and presumptive identification of *Escherichia coli* and *Salmonella* species. 2+4+4

Chattogram Veterinary and Animal Sciences University
Department of Microbiology and Veterinary Public Health
MS in Microbiology; July-December 2021
Subject: Advanced Systemic Virology; Course Code: ASV-602
Total Marks: 40; Time: 2 hours

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

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| 1 | a | Define genetic shift and drift. Mention the different strains of NDV with examples. | 4 |
| | b | What is 'take'? Write down the laboratory diagnostic procedure for the classical swine fever virus. | 4 |
| | c | Enlist the viruses that cause profuse bloody diarrhea. | 2 |
| 2 | a | Briefly describe the molecular criteria for characterization of HPAIV. Mention five HPAIV subtypes that cause high mortality in chickens. | 5 |
| | b | Mention the vectors and possible consequences found in the intact host and embryonated egg during the propagation of LSDV. | 3 |
| | c | Enlist the viruses that cause embryonic hemorrhage and mortality during virus culture. | 2 |
| 3 | a | Define virus reassortment. Write down the difference between avian leucosis and Marek's disease viruses. | 4 |
| | b | Mention five specific viruses that cause immunosuppression in different host bodies. Write down the morphology and structural components of the hog cholera virus and mention the target organs that are infected by this virus. | 4 |
| | c | Mention different host cell receptors that act as mediators for the viruses to enter the host body. | 2 |
| 4 | a | State the condition, when you observe the blue eyes of Dogs? What are the samples you will collect and how will you laboratory diagnose the cat plague? | 4 |
| | b | Which pathotypes are used for the preparation of the IBD vaccine? Write down the virulence properties of viruses that evade the host immune response. | 4 |
| | c | What is the pantropic virus? Mention three semen-borne viruses. | 2 |
| 5 | a | What does BCRDV stand for? Write down the special features or shapes of the following viruses,
Fowl pox virus, Rabies virus, Rota virus, IBV, Hepatitis virus, Ebola virus | 4 |
| | b | Write down the short note of the following viruses; | 3+ |
| | | I. SARS-CoV-2 | 3= |
| | | II. Nipa virus | 6 |

Chattogram Veterinary and Animal Sciences University

MS in Microbiology Final Examination; July-December Semester, 2021

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

Full Marks: 40; Time – 2 hours

Answer any 4 (FOUR) questions.

1. How can you confirm a case of endocarditis in a bird caused by *Streptococcus equi* subspecies *zooepidemicus*? Enumerate the virulence factors of *Staphylococcus* species that can cause diseases in avian species. Describe the etiology of bumble foot of poultry. 10
2. How many serogroups and serotypes are within the species of *Pasteurella multocida*? What is the basis of serotypic classification of *Pasteurella multocida*? How can you isolate and identify the organism from an acute case of fowl cholera? Write down the morphological features of *Mycoplasma gallisepticum*. 10
3. How can you isolate and identify a non-typhoidal serovar of *Salmonella* in laboratory from poultry farm samples? Give a brief list of different kinds of antigens seen in *Escherichia coli*. What are the serovars of *Chlamydophila psittaci*? 10
4. List the names of the proteins produced by avian influenza virus. High mortality in chickens can be caused by both highly pathogenic avian influenza virus and virulent Newcastle disease virus. How can you ascertain the real cause behind such mortality by differentiating one from the other providing solid laboratory evidence? 10
5. What morphological features make infectious bursal disease virus comparatively more tolerant to different chemical treatment? Is there any strain variation in infectious bursal disease virus? What would be a better vaccination procedure to control infectious bursal disease more effectively in an endemic setting? How can you confirm a duck plague outbreak by laboratory testing on samples collected from an affected farm? 10

Chattogram Veterinary and Animal Sciences University

MS in Microbiology

July- December 2022

Subject: Advanced Immunology and Serology

Course code: AIS 602

Total marks: 40

Time: 2 hours

Answer any four (4) questions

- 1
 - a What are the changes in endothelium and neutrophil at the time of phagocytosis process? 3
 - b How do microbes evade phagocytosis process? 3
 - c What is PAMP and PRR? List some examples of PRR corresponds to PAMP molecules 4
- 2
 - a Draw and label receptors and correspond ligand molecules associated with presentation of antigen presenting cell to a CD4+ lymphocyte 4
 - b How will you proof that CD4+ co-receptor and MHC are essential for immune response during antigen presentation by APC with diagram 6
- 3
 - a What is complement? Mention roles of complement in immune system 2
 - b Explain classical and lectin pathway of complement activation 8
- 4
 - a Explain basic structure of IgG molecule with a labelled neat diagram 4
 - b Differentiate among different classes of Ig in a tabular form 6
- 5
 - a Define hypersensitivity? Enumerate the basis of classification of hypersensitivity? 3
 - b Illustrate the mechanism of type I and IV hypersensitivity. 7

Chattogram Veterinary and Animal Sciences University

MS (Microbiology)

July-December 2021

Subject: Molecular Microbiology

Course code: MOE 602

Total marks: 40

Time: 2 hours

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

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| 1 | a | Illustrate DNA replication process with neat diagram | 5.0 |
| | | What do you mean by operon? Explain Lac Operon model in E. coli | 5.0 |
| 2 | a | What is restriction enzyme? What do you mean by 3' and 5' overhang? | 5.0 |
| 2 | a | Explain the following terms: Isoschizomers, filling in, trimming back, homopolymer tailing. | 5.0 |
| 3 | a | Explain Southern blot process with neat diagram. | 5.0 |
| | b | Explain how can you extract and purify nucleic acids from the cell. | 5.0 |
| 4 | a | What do you mean by selectable markers and insertional inactivation? How these two methods will help you in selecting blue and white colony in gene cloning? | 10.0 |
| 5 | a | What is gene sequence? Explain Sanger sequencing method with diagram. | 10.0 |

Chattogram Veterinary and Animal Sciences University
Department of Microbiology and Veterinary Public Health
MS in Microbiology; July-December 2021
Subject: Vaccinology; Course Code: VCL-602
Total Marks: 40; Time: 2 hours

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

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|---|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1 | a) | Define Vaccinology. Briefly describe the technology and chemicals used for the production of inactivated bacterial and viral vaccines. | 4 |
| | b) | How will you determine the virulence properties of a virus or bacteria during the attenuation process? Enlist the laboratory tests that will be performed for the preparation of an effective vaccine. | 4 |
| | c) | Define toxoid vaccines with examples. | 2 |
| 2 | a) | Write down the concept and mode of action of the autogenous vaccine. How will you improve the effectiveness of the autogenous vaccine? | 5 |
| | b) | Write down the significance of the marker vaccine. Mention the ideal properties of an effective marker vaccine. | 3 |
| | c) | State the possible cause of vaccine failure. | 2 |
| 3 | a) | What are the factors that commonly influence the outcome of animal vaccinations against infectious diseases? | 4 |
| | b) | Suppose you are appointed as a microbiologist in the LRI anthrax vaccine unit. Describe, What are the requirements needed for the final release of the anthrax vaccine for the field vaccination program? | 4 |
| | c) | Sketch the mode of action of the adjuvant. | 2 |
| 4 | a) | Illustrate the different approaches to the development of genetically engineered vaccines. | 6 |
| | b) | List the veterinary vaccines available in Bangladesh produced by LRI, mentioning their species, age, route, and dose. | 4 |
| 5 | a) | Define vaccine bank. Briefly describe the structural and non-structural components of bacteria and viruses targeted for the production of quality vaccines. | 4 |
| | b) | Write down the following short notes:
I. Immunotherapy
II. m-RNA Vaccine | 3
+3=6 |