

Chattogram Veterinary and Animal Sciences University

MS in Microbiology

July-December 2019

Subject: Vaccinology

Corse Code: VCL-602

Total Marks: 40

Time: 2 hours

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

- 1 a Explain In ovo vaccination? Justify the statement 'Age and Maternal antibodies are crucial factors for vaccination of animals and birds'. 5
- b Which routes of vaccination is most suitable for antigenic stimulation and explains the logic behind it? Describe the intracellular pathway of MHC class I presentation of antigen. 5
- 2 Attenuation or inactivation is fundamental task for vaccine preparation. What are the approaches you will follow for manufacturing of live vaccine from virulent wild strain virus? 10
- 3 a Briefly explain the subunit vaccines and synthetic peptide vaccines. 5
- b After preparation of anthrax vaccine, What are the tests you will perform before release the vaccine in field condition? 5
- 4 a Define GLP and GMP. 3
- b Suppose, a layer flock is infected with NDV and causes high mortality. Veterinarians suggest that whole layer flock will be immunized with immune yolk of immunized birds. What are the minimum requirements and manufacturing process you will followed for preparation of immune yolk. 7
- 5 a List the vaccines available in Bangladesh produced by LRI mentioning their species, age, route and dose. 5
- b Define anti-idiotypic vaccine. Explain the immunological mechanism of antibody production after administration of vaccines within the host body. 5

Chattogram Veterinary and Animal Sciences University

MS in Microbiology Final Examination; July-December Semester, 2019

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

Full Marks: 40; Time – 2 hours

Answer any 4 (FOUR) questions

1. What are the major virulence factors seen in *Staphylococcus*? How many serogroups and serotypes are in the species *Pasteurella multocida*? What factors make *Escherichia coli* infections very difficult to control by vaccination? 10
2. Give a brief outline of the principles to follow for serotyping of *Salmonella* strains under the White-Kauffman-Le Minor scheme. How can you isolate a strain of *Salmonella* belonging to a motile serovar? Describe the morphological and antigenic features of *Chlamydophila psittaci*. 10
3. What are the molecular features that help *Mycoplasma gallisepticum* evade immune response of the host? How can you estimate seroprevalence of *Mycoplasma gallisepticum* in a poultry farm? What is the basis of subtyping of avian influenza A viruses? Name the proteins that are produced by different genes of avian influenza A virus. 10
4. What is the minimum motif of amino acid sequence for a strain of avian paramyxovirus type 1 that needs to be considered to identify it as a virulent virus? What are the known pathotypes of the virus? How can you design an ideal vaccination strategy for a poultry farm against infectious bursal disease in Bangladesh considering the virological and immunological characteristics of the virus? 10
5. What are the proteins produced by infectious bronchitis virus and what is the molecular basis for strain variation and evolution of different serotypes of the virus? Write down the procedures that can be used to isolate an infectious bronchitis virus from poultry followed by its serotyping. How can you isolate and identify an anatid herpes virus 1 from a duck plague outbreak affecting geese? 10

Chattogram Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2019

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) Enumerate the bacterial pathogens implicated in canine pyometra. Give an overview of microscopic appearance of the gas gangrene clostridia. 1+3
b) Write down the virulence attributes of *Campylobacter* species. How can you isolate and identify *Campylobacter jejuni* from poultry? 3+3
2. a) Name the main diseases caused by the major pathogenic *Corynebacterium* and *Actinobacillus* species in veterinary medicine. 4
b) State the general features of *Actinomyces*, *Actinobaculum*, *Truperella* and *Nocardia* species. Identify the differences in laboratory findings for canine nocardiosis and canine actinomycosis. 4+2
3. a) List the methods commonly used for the molecular typing of staphylococci. Explain the role of mycobacterial lipids in the pathogenesis of *Mycobacterium bovis* infection. 2+3
b) Illustrate the stages in the invasion of cells and intracellular spread by *Listeria monocytogenes*. 5
4. a) Describe the antigenic features of *Escherichia coli*. Give a brief outline on uropathogenic *E. coli* (UPEC). 4+3
b) How can you isolate and characterize *Escherichia coli* from chickens with colibacillosis? 3
5. a) What is the basis of serotyping of *Pasteurella* and *Mannheimia* species? Write down the colony morphology of *Pasteurella multocida* on blood agar. 2+2
b) Mention the diseases caused by non-spore forming anaerobes. Write down the test methods available for the diagnosis of infection with *Brucella abortus*. List the stress factors which have been most often associated with the development of clinical salmonellosis. 2+2+2

Chattogram Veterinary and Animal Sciences University

MS in Microbiology

July-December 2019

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 Mention the enzymes with their specific roles involve with DNA replication. 5
Write down the difference between prokaryotes and eukaryotes protein synthesis.
- b Define Shine-Dalgarno? List the restriction endonucleases enzyme with their 5
recognition site and specific ends generated during cutting the DNA.
- 2 a Define cell lysate? Briefly explain the enzymatic process and column purification 4
methods for nucleic acid extraction.
- b Mention the secondary structure that should be avoided during primer design. 2
How will you Calculate the T_m and annealing temperature of primer?
- c Enlist five important software tools used for primer designing. Write down the 4
essential steps for primer designing using online database as well as software
tools.
- 3 a Illustrate the synthesis of cDNA from mRNA. Which chemicals you will use to 4
separate cDNA strand from mRNA strand.
- b What is Coding Sequence (CDS)? How is it different from the ORF? 3
- c What is VNTR? What is the meaning of splice out of intron during translation? 3
- 4 a Enlist different band based and sequence based techniques for typing of organism. 5
Write down the drawback of phenotyping typing methods.
- b Describe the linker and adapter methods with example for modification of DNA 5
fragments.
- 5 a Differentiate between DNA sequencing and metagenomic sequencing. Briefly 6
describe the classical Sanger sequencing methods of DNA sequencing.
- b What is microbiome? What are the advanced methods used for DNA sequencing? 4

Chattogram Veterinary and Animal Sciences University

MS in Microbiology

July-December, 2019

Subject: Advanced Immunology and Serology

Course code: AIS 602

Total Marks: 40; Time: 2 hours

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

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| 1 | Summarize the contribution of different scientists in the field of immunology including mentioning nobel laureate scientists. | 10 |
| 2 | a Differentiate adaptive immunity from innate immune response. | 3 |
| | b Discuss different components of innate immune system | 7 |
| 3 | a Why lymphoid organs are important for immunology? | 2 |
| | b Discuss histology of thymus, lymph node, spleen and bursa of Fabricius. | 8 |
| 4 | a Mention receptors in CD4+ lymphocyte while come in contact with APC containing processed antigen with appropriate ligand molecule. | 3 |
| | b Discuss processing of killed viral vaccine antigen processing in mammalian system. | 7 |
| 5 | a Differentiate serum sickness and Arthus reaction. | 2 |
| | b Explain mechanism of type I hypersensitivity and differentiate from type IV. | 8 |

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MS in Microbiology Final Examination

July-December Semester, 2019

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.

- * Q.1 State the Baltimore classification of viruses. Mention families of viruses with their nucleic acid, symmetry and envelope under each class. 10
- Q.2 a) Mention the segments of Avian Influenza virus with the protein coded. 4
b) How will you characterize HPAI and LPAI? 6
- Q.3 a) List arboviruses. Describe the etiology, epidemiology and control of Foot and Mouth Disease virus. 5
b) Mention the lineages of PPR virus. Describe the diagnosis and control of Canine parvo viral infection. 5
- Q.4 a) State important members of Herpesviridae family with their disease. How will you diagnose a case of pox virus infection in laboratory? 5
b) Mention the epidemiology and pathogenicity of Duck plague virus. 5
- Q.5 Write short notes on any two: 5x2=10
a) MERS-CoV
b) Nipah virus
c) Dengue Hemorrhagic Fever