

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2017

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 Mention the genome (type, strand and sense), symmetry, presence of envelope and site of replication with examples of each family: *Poxviridae*, *Paramyxoviridae*, *Parvoviridae*, *Rhabdoviridae*. 10
- Q.2 a) Write down the important members of *Paramyxoviridae* with their diseases and host. 4
- b) Write down the etiology, epidemiology, diagnosis, prevention and control of Nipah viral disease. 6
- Q.3 a) Categorize the exposure to dog in relation to rabies according to WHO. Mention lab diagnostic procedure of rabies. 2+4
- b) Differentiate Marek's disease from Avian leukosis. 4
- Q.4 a) List important members of *Herpesviridae* having veterinary importance. Write down common lab diagnosis of pox virus. 5
- b) Write down the lab diagnosis procedure of Avian Influenza (AI) 5
- Q.5 Write short notes on any two: 5x2=10
- a) MERS-CoV
 - b) Ebola Hemorrhagic Fever
 - c) Zika viral disease

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination; July-December Semester, 2017

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

Full Marks: 40; Time – 2 hours

Answer any 4 (FOUR) questions

1. List the diseases caused by *Streptococcus* and *Enterococcus* species in poultry. How can you confirm a case of osteomyelitis in poultry caused by *Staphylococcus aureus*? What do you mean by spa typing used for *Staphylococcus aureus*? 10
2. Describe the variability of antigenic constituents seen in *Escherichia coli*. List the O-serotypes of *Escherichia coli* commonly encountered with different disease conditions in poultry. Briefly state the basis of “White-Kauffman-Le Minor” scheme for serotyping *Salmonella*. 10
3. How can a fowl cholera case be confirmed by laboratory investigations? What is the way to differentiate *Pasteurella* strains into different serovars? How does *Mycoplasma gallisepticum* evade immune response of its host? Describe the replication process of *Chlamydophila psittaci*. 10
4. Why infectious bronchitis virus variants constantly emerge and pose economic threats to poultry farms worldwide? How can an outbreak of infectious bronchitis in chickens be diagnosed? What are the points you need to consider to vaccinate a flock against infectious bursal disease? 10
5. Describe the etiology of duck viral hepatitis. What are the advantages and disadvantages of F- and L-gene based reverse-transcription polymerase chain reaction to identify Newcastle disease virus strains? PQR*E*TR*GLF – This is the amino acid sequence at the hemagglutinin (HA) cleavage site of an avian influenza A virus subtype H5. Justify whether it signals the presence of a low pathogenic or a high pathogenic avian influenza virus. 10

Chittagong Veterinary and Animal Sciences University

MS in Microbiology

July-December Semester, 2017

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)

- 1 a Mention contribution of five Nobel laureate scientists in the field of immunology with mentioning their works. 4
- b Explain overview of immune response in vivo with diagram. 3
- c Draw a diagram of proteolytic fragment of IgG. 3
- 2 a Explain properties of cytokine 3
- b Illustrate function of three important cytokines in mammals. 7
- 3 a Classify hypersensitivity and mention basis of classification. Elucidate mechanism of type I hypersensitivity. 5
- b Mention the proof for following conditions: requirement of self MHC, CD4+ molecule for extracellular antigen, APC requires time for antigen processing. 5
- 4 a What do you mean by auto immune disease? 3
- b Explain different categories of immune disease. 7
- 5 a What is monoclonal antibody? 3
- b Elucidate mechanism of production of monoclonal antibody and its uses. 7

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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 Mention the genome (type, strand and sense), symmetry, presence of envelope and site of replication with examples each family: Herpesviridae, Birnaviridae, Picornaviridae, Orthomyxoviridae, Retroviridae. 10
- Q.2 a) What are the differences between HPAI and LPAI? Mention the laboratory diagnosis and control strategies for avian influenza. 2+3+2
- b) List veterinary important members Parvoviridae. What are the subtypes of canine parvo virus? How will you control parvo viral infection? 1+1+1
- Q.3 a) Write down the virion properties, serotypes, epidemiology and pathogenicity of FMD virus. 5
- b) List proteins of Infectious Bronchitis virus with functions. Mention serotyping of the virus along with lab diagnosis procedure. 5
- Q.4 a) Write down the epidemiology, pathogenicity, lab diagnosis and control of rabies. 5
- b) Mention the strains and pathotypes of Infectious Bursal Disease virus. Write down the control strategies of IBD. 5
- Q.5 Write short notes on any two: 5x2=10
- a) Canine distemper virus
 - b) Duck viral enteritis virus
 - c) Peste des Petits Ruminants (PPR) virus

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2017

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 principal virulence determinants of *Staphylococcus pseudintermedius*. What is the basis of Lancefield grouping scheme used for streptococci? Mention different molecular diagnostic and typing methods currently used for species and strain identification of *Staphylococcus pseudintermedius*. 6
- b) Which organism causes swine erysipelas and how can the disease be diagnosed in laboratory? 4
2. a) Write down the mechanism of action of heat labile enterotoxin produced by enterotoxigenic *Escherichia coli*. 5
- b) Make a flowchart outlining the isolation, identification and typing methods for *Listeria monocytogenes* in environmental samples. 5
3. a) What property does mycolic acid confer on mycobacteria? Give an overview of possible consequences of *Mycobacterium bovis* infection in cattle acquired via aerosols. List the test methods available for diagnosis of paratuberculosis. 7
- b) What is RTX toxin? Write down the chemical composition of X and V factors and nutrients supplied by them. 3
4. a) Write down the general features of the genera *Actinomyces* and *Actinobacillus*. Explain the developmental cycle of *Dermatophilus congolensis*. 5
- b) Name the suitable specimens required from the various clinical conditions for the detection of *Campylobacter* species? Describe the laboratory investigation procedures to be followed for the identification of *Campylobacter jejuni*. 5
5. a) Give a brief description on antigenic characteristics of *Escherichia coli*. Name the bacteria frequently isolated from the urinary tract of domestic animals. 6
- b) Write down the steps for the isolation of salmonellae from clinical specimens. 4

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MS in Microbiology

July-December Semester, 2017

Subject: Molecular Microbiology

Course code: GMT-602

Total Marks: 40 Time: 2 hours

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

- 1 a Enlist the enzymes required for DNA replication, transcription and translation with their function. 4
- b Differentiate DNA replication of prokaryote than eukaryote. 3
- c Explain the purpose of Shine-Dalgarno sequence in translation in prokaryote. 3

- 2 a Define transgenics. 1
- b Explain different process for the production of transgenic animal. 6
- c What are the steps to be remembered in designing a primer? 3

- 3 a Explain how does insertional inactivation helps in pUC18 to find out the right clone? 5
- b How you can you modify blunt end of an insert into sticky end and vice versa with example? 5

- 4 a How Sanger's knowledge on DNA replication helps to elucidate unknown sequence of DNA? 10

- 5 a Role of positive and negative selectable marker in gene knock out mechanism. 5
- b What is genomic library? How can you screen a target sequence from a genomic library? 5

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2017

Course Title: Vaccinology

Course Code: VCL 602

Total Marks: 40 Time: 2 hours

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

1. a) Enumerate the properties of an ideal vaccine. Write down the factors that may influence the outcome of vaccination. 2+3
b) What do you mean by Good Laboratory Practice (GLP) and Good Manufacturing Practice (GMP)? Write down the different types of test methods to determine potency of vaccines. 2+3

2. a) Briefly describe the intracellular pathways of MHC class I and class II restricted processing and presentation of antigen. 7
b) What should be the contents of a veterinary vaccine labels? 3

3. a) List the approaches to the design of viral vaccines. Describe different approaches usually employed in developing marker vaccine. 3+4
b) Mention the origin of the main strains of rabies virus used for challenge or for vaccine manufacturing. 3

4. a) Make a list of adjuvants commonly used in veterinary practice. Outline the ways in which the adjuvants may act to enhance immune responses triggered by vaccine antigens. 2+3
b) Briefly describe the process for manufacturing anthrax vaccine. 5

5. Write short notes on (any two): 5 x 2 = 10
 - a) Anti-idiotypic vaccine
 - b) Vaccine banks
 - c) Nucleic acid vaccine