

Chittagong Veterinary and Animal Sciences University

MS in Microbiology

July – December 2016 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 BMR and SOP. Write down the characteristics of seed lot for Anthrax vaccine production. 3
b) Briefly describe the procedure of Anthrax vaccine production. 7
2. a) What do you mean by purity, safety, stability and efficacy of a vaccine? Write down the importance of stability tests and efficacy tests for different vaccines. 5
b) Enlist the common livestock vaccines produced in Bangladesh. Describe the routes and procedures for vaccination in poultry. 5
3. a) Differentiate between live and killed vaccines. Write down the advantages and disadvantages of both vaccines. 5
b) Write down the vaccination schedule for broiler breeder and dog. 5
4. a) Describe briefly about combined vaccine with example. What is immunomodulation? Classify with example. 5
b) Define adjuvant. Classify adjuvant according to their mode of action. 5
5. Write short note on **any four** – 2.5×
 - i) Production facilities of vaccine
 - ii) Diva vaccine
 - iii) Vaccination failure
 - iv) Autogenous and vector vaccine
 - v) Vaccine assessment for efficacy4=10

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2016

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) Describe the events involved in the invasion, intracellular growth and cell-to-cell spread of *Listeria monocytogenes*. 5
b) Make a list of Leptospiral species containing pathogenic serovars. Describe the procedures for the isolation and identification of *Leptospira* from clinical specimens. 5
2. a) Give an overview of pathogenesis of infection due to *Pseudomonas aeruginosa*. 4
b) Write down the virulence attributes of *Pasteurella multocida*. Mention different molecular diagnostic and typing methods available to identify and characterize the isolates of *Pasteurella multocida*. 6
3. a) List the bacteria commonly implicated in mixed respiratory infections in young animals. Explain the role of *Campylobacter fetus* subsp. *venerealis* in infertility in cattle. 5
b) Describe the laboratory procedures for the isolation and identification of *Brucella abortus* from an aborted calf. 5
4. a) Enumerate the factors which may predispose young farm animals to infection with pathogenic *E. coli* strains. Explain the mechanism of action of enterotoxins STa and STb produced by enterotoxigenic *E. coli* (ETEC). 7
b) Write down the current scheme for classifying the genus *Salmonella*. 3
5. a) Along with the functions write down the virulence determinants of *Bacillus anthracis* associated with plasmids. 5
b) Give the structure and function of tetanospasmin. 5

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MS In Microbiology

July-December Semester, 2016

Molecular Microbiology

Course code: MMB-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 | What is central dogma? | 2 |
| | b | How does DNA replication vary from prokaryote to eukaryote? | 3 |
| | c | Explain DNA replication in eukaryote. | 5 |
| 2 | a | What are the different ways to convert blunt end to sticky end and vice versa of a vector? | 6 |
| | b | Differentiate adapter from linker. | 4 |
| 3 | a | Differentiate dideoxy sequencing from Maxam and Gilbert method of DNA sequencing | 2 |
| | b | How can you sequence a bacteriophage genome using Sanger's method? | 8 |
| 4 | a | What are the fundamental principles for gene cloning? | 3 |
| | b | Illustrate a typical commercial vector which is commonly used in gene cloning. | 7 |
| 5 | a | Explain the mechanism of producing gene knockout mice. | 10 |

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July – Dec Semester 2016

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. a) Name two viruses belonging to each group with mentioning their family, type of nucleic acid, presence or absence of envelop, site of replication and symmetry- 2×4
=8
I) Immunosuppressive virus II) Virus causing zoonotic infection
III) Vertically transmissible virus IV) ARBO virus.
- b) Write down the virion properties and diagnosis of PPR virus. 2
2. a) Differentiate between Marek's disease and Lymphoid leukosis. 2
- b) Briefly Describe etiology, epidemiology, diagnosis and prevention of Canine Distemper virus. 5
- c) Name five important viruses under Paramyxoviridae and Herpes viridae. How can you characterize different pathotypes of NDV? 3
3. a) Briefly describe the biological properties, diagnosis and prevention of HPAI virus. 5
- b) Write down the genomic properties, mode of transmission and control of Infectious bronchitis virus. 5
4. a) Describe in brief the genome properties and diagnosis of Poxvirus. 4
- b) Describe the epidemiology, cultivation and control measures of FMD in cattle. 4
- c) How can you cultivate Duck viral hepatitis virus? 2
5. Write short note on any two - 5×2
=10
 - I) Egg drop syndrome
 - II) Infectious bursal disease
 - III) Infectious canine hepatitis

Chittagong Veterinary and Animal Sciences University

MS in Microbiology Final Examination

July-December Semester, 2016

Course Title: Avian Microbes

Course Code: AMB-602

Full Marks: 40, Time – 2 hours

Answer any 4 (FOUR) questions.

1. Enumerate Staphylococcal major virulence factors. What is the basis of Heddleston serotyping scheme used for *Pasteurella multocida*? Give a brief description on antigenic diversification seen in avian pathogenic *Escherichia coli* (APEC). 10
2. Give morphological and antigenic properties of *Chlamydomphila psittaci*. How can you diagnose psittacosis in parrots? Name the ways by which *Mycoplasma* evades immune response of a host. How can a poultry flock be investigated serologically to assess its status for mycoplasmosis? 10
3. Which organism causes bumblefoot in poultry and how can the disease be diagnosed in laboratory? Name the major proteins produced by avian influenza viruses? Do you think that highly pathogenic avian influenza attributed to subtype H5N1 can be controlled by vaccination? Justify your opinion. 10
4. Briefly describe the structural components of infectious bronchitis virus (IBV). Compare between anatid herpes virus 1 and duck hepatitis A virus type 1. What are the virus variants associated with Marek's disease of chickens? Do you recommend vaccination against infectious laryngotracheitis of poultry in Bangladesh? Justify your opinion. 10
5. Below is a part of the abstract of an article published by Desingu *et al.* (2016) in Avian Pathology Journal titled Molecular characterization, isolation, pathology and pathotyping of peafowl (*Pavo cristatus*) origin Newcastle disease virus isolates recovered from disease outbreaks in three states of India: 10(2+3+3+2)

“Disease outbreak investigations were carried out in three states of Northern India namely Haryana (Rewari), Uttar Pradesh (Noida) and Delhi, where a total of 110 Indian peafowls (*Pavo cristatus*) showed sudden onset of nervous signs and died within a period of two weeks during June, 2012. The F (fusion) gene-based RT-PCR detection of Newcastle disease virus (NDV) in affected tissues confirmed the presence of the virus. Three NDV isolates were selected (one from each area under investigation) and further characterized. They were found to be of virulent pathotype (velogenic NDV) based on both pathogenicity assays (MDT, ICPI and IVPI) and partial F gene sequence analysis.”

Read the contents carefully and answer the following questions:

- (a) What were the probable samples they collected from the dead birds for their investigations?
- (b) What do you mean by MDT, ICPI and IVPI?
- (c) For what evidence they performed partial sequence analysis of the F gene of the isolates selected?
- (d) What will be the name of the virus isolate they have isolated from the area under Delhi?

Chittagong Veterinary and Animal Sciences University

MS In Microbiology

July-December Semester, 2016

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 What are the scientific evidences for following events?
 - a Cytosolic antigen is presented by antigen presenting cell associated with class I MHC molecule 3
 - b Extracellular antigen is presented by APC associated class I MHC molecule 3
 - c APC requires time for antigen processing 4

- 2
 - a What is the basis of classification of hypersensitivity 3
 - b Differentiate type I hypersensitivity from type IV hypersensitivity 7

- 3
 - a What is tolerance? 2
 - b How can you induce T and B cell tolerance in a lab animal? 8

- 4
 - a Discuss the role three cytokines which mediate immune response 10

- 5
 - a Explain the phagocytic process. 10