B.V.Sc. & A.H. (Second Professional) Examination – 2025
Veterinary Microbiology Paper –I
(MSVE 2016)

Time: Three Hours **Maximum Marks: 100**
Weightage: 20

Unit-1 (General & Systematic Veterinary Bacteriology)
Unit-2 (Veterinary Mycology)
Unit-3 (Microbial Biotechnology)

Instructions:

1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 The mordant used in Gram's staining is _____.

1.2 Biphasic variation is shown by _____ antigen of *Salmonella.*

1.3 Fried egg colonies are mainly produced by _____.

1.4 The most important and pathogenic species of genus *Aspergillus* is _____ _____.

1.5 The process in which the genetic message in the mRNA is used to synthesize peptides with the help of ribosome is called _____.

1.6 Vi antigen of *Salmonella* is associated with _____.

1.7 *Mycobacterium bovis* exhibit eugenic growth in presence of _____.

1.8 The optimum pH required for *Ureaplasma* growth is _____.

1.9 Lancifield classification based on the _____of the streptococci.

1.10 The Okazaki fragments in the lagging strands are joined by_____ enzyme.

1.11 Capsule of *Bacillus anthracis* is made up of _____.

1.12 To facilitate the isolation of *Listeria* sp specimen grown in nutrient broth and incubated at _____°C temperature.

1.13 Strangles in horse is caused by _____.

1.14 *Corynebacterium* rods are arranged in a fashion which is called as _____ _____.

1.15 Lumpy jaw disease is caused by _____.

1.16 Anaerobic bacilli giving rise to most potent exotoxin and have little or no power to invade tissue or multiply in tissue is _____.

1.17 Metachromatic granules produced by _____.

1.18 In nutrient gelatin stab *Bacillus anthracis* produce _____.

1.19 Autoclaving kills the bacteria by steam under pressure (15 lb/inch^2) at _____ °C for 15 min.

1.20 Sea gull-winged appearance demonstrated by _____.

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question: (20x0.5 = 10)

2.1 Parasitic fungi living on the skin, nail or hair of animals are called: ( )

1. Subcutaneous fungi
2. Dermatophytes
3. Cutaneous fungi
4. Systemic fungi

2.2 Natural occurrence of *Cryptococcus neoformans* is associated with: ( )

1. Pigeon manure
2. Cow dung
3. Decaying sugarcane bagasse
4. None

2.3 Which among the following bacteria is is capnophilic? ( )

1. *Vibrio cholerae*
2. *Brucella* spp
3. *Leptospira* spp
4. All of the above

2.4 Malta fever in human is caused by ( )

1. *Brucella abortus*
2. *Brucella melitensis*
3. *Brucella canis*
4. *Bacillus anthracis*

2.5 Diamond skin disease in pigs is caused by ( )

1. *Erysipelothrix rhusiopathiae*
2. *Pasteurella multocida*
3. *Salmonella* spp
4. *Mycoplasma spp*

2.6 Transfer of recombinant DNA to a bacterial host cell is called as ( )
1. Transformation
2. Transduction
3. Conjugation
4. Recombination

2.7 Nagler's reaction with *Clostridium perfringens* on egg yolk agar is due to
1. Haemolysin ( )
2. Mucin
3. Toxin
4. Lecithinase

2.8 Which among the following is the start codon? ( )
1. AUG
2. UUG
3. UAG
4. AUC

2.9 Which among the following inhibits bacterial cell wall synthesis? ( )
1. Penicillins
2. Polymixin B
3. Tetracyclines
4. Sulfonamides

2.10 Fowl cholera in poultry is caused by ( )
1. *Pasteurella multocida*
2. *Salmonella* Gallinarum
3. *Avibacterium paragallinarum*
4. *Mycoplasma gallisepticum*

2.11 IMViC test results for *E. coli* is ( )
1. ++−−
2. −−++
3. −+−+
4. −−+−

2.12 Motility in Leptospira is due presence of ( )
1. Pilli
2. Flagella
3. Pseudopodia
4. Endoflagella

2.13 Member of the Genus…. required X or V factor in the medium for growth
1. Brucella ( )
2. Listeria
3. Morexella
4. Haemophilus

2.14 Which of the following bacteria is non-motile ( )

1. *Salmonella enteritidis*
2. *Clostridium perfringens*
3. *Proteus vulgaris*
4. *Escherichia coli*

2.15 Strauss reaction is shown by ( )

1. *Brucella abortus*
2. *Pseudomonas mallei*
3. *Actinobacillus lignieresii*
4. All of the above

2.16 *Dichelobacter nodosus* causes

1. Mastitis in buffalo
2. Footrot in sheep
3. Ulcer in tongue
4. Diarrhoea Mucin

2.17 Plasmids used as vectors have following property ( )

1. Must have origin of replication
2. Must have unique restriction sites
3. Both 1 and 2
4. None of above

2.18 Find the incorrect pair ( )

1. Edward's Media *Streptococcus*
2. Korthoff's medium *Leptospira*
3. Levinthal's medium *Hemophilus*
4. Mannitol salt agar *Brucella*

2.19 Bumble foot in poultry is caused by ( )

1. *Campylobacter fetus*
2. *Brucella abortus*
3. *Leptospira*
4. *Staphylococcus spp*

2.20 Which medium used for *E. coli* to produce Metallic sheen ( )

1. MacConkey Agar
2. Blood Agar
3. Eosin Methylene Blue Agar
4. Edward's Medium

Q.3 Attempt any <u>ten</u> out of the following twelve questions. Answer of each question should be in 2 to 3 lines. (10x2.0= 20)

3.1 Transformation

3.2 Virulence

3.3 Mycelium

3.4 Mechanical vectors

3.5 Pseudo hyphae

3.6 Attenuation

3.7 Latent infection

3.8 Exotoxin

3.9 Restriction endonucleases

3.10 Satellitism

3.11 Flagella

3.12 Protoplast

Q.4 Attempt any <u>six</u> out of the following eight questions. Answer of each question should be in 8 to 10 lines. (6 x 6.0 = 36)

4.1 Koch's postulates

4.2 Mallein test

4.3 Mechanism of anthrax toxin

4.4 Woods lamp technique

4.5 Recombinant DNA technology

4.6 Toxins produced by the *Clostridium perfringens* types

4.7 Gram negative bacterial cell wall

4.8 Mis-sense mutations and Non-sense mutations

Q.5 Answer the following question in 1-2 pages (attempt any two). (2x12.0 = 24)

5.1 Discuss in brief etiology, pathogenesis, diagnosis, prevention & control of Bovine tuberculosis. (each subdivision has 3 marks)

5.2 Discuss in brief etiology, pathogenesis, diagnosis, prevention & control of Tetanus in cattle. (each subdivision has 3 marks)

5.3 Discuss in brief etiology, pathogenesis, diagnosis, prevention & control of Haemorrhagic septicaemia in cattle. (each subdivision has 3 marks)

B.V.Sc. & A.H. (Second Professional) Examination – 2025
Veterinary Microbiology Paper –II
(MSVE 2016)

Time: Three Hours **Maximum Marks: 100**
Weightage: 20

Unit-4 (Veterinary Immunology and Serology)
Unit-5 (General and Systematic Veterinary Virology)

Instructions:
1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 When toxic properties of a toxin are abolished (destroyed), but its ability to stimulate an immune response is retained, it is called _____.

1.2 The target molecule to stimulate RIG like receptors is _____.

1.3. The antibody isotypes found on the surface of naïve B cells are _____ and _____.

1.4 After subsequent exposure to an antigen, antibodies undergo _____ in their variable domains of immunoglobulin genes, resulting in affinity maturation.

1.5 The _____ isotype of antibody has a secretory component and can be found as a monomer, dimer, or tetramer.

1.6 The _____ cells are absent from the paracortex of lymph nodes.

1.7 An _____ is the specific part of an antigen that is recognized and bound by an antibody or a T-cell receptor.

1.8 _____ are molecules that coat the surface of a pathogen or particle to enhance its recognition and ingestion by phagocytic cells.

1.9 The polymerization of C-9 complement molecules produces _____, the end- product of the terminal pathway of the complement system.

1.10 Multiple sclerosis and systemic lupus erythematosus are examples of _____.

1.11 _____ and _____discovered the first animal virus by demonstrating that FMD in cattle was caused by a filterable agent (virus).

1.12 African swine fever virus is transmitted by ticks of genus _____ spp.

1.13 The specific site or compartment of a cell where replication of a virus occurs is known as _____

1.14 The genome of *Paramyxoviridae, Rhabdoviridae* and *Filoviridae* is composed of _____, _____, _____, _____.

1.15 Duck enteritis virus is a member of genus _____ of family _____.

1.16 The DIVA-based ELISA of FMD virus is based on the detection of _____ proteins like 3ABC, 3AB and 2C.

1.17 _____ and _____ viruses have non-enveloped virion, icosahedral symmetry and double-stranded segmented RNA as their genome.

1.18 Episomal circular DNA and oncogenic potential are characteristic of the family _____.

1.19 The enveloped virus family with helical symmetry and a single-stranded positive-sense RNA genome is exemplified by _____.

1.20 Coggins test used for diagnosis of Equine infectious anaemia, is immunologically an _____ test

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question: (20x0.5 = 10)

2.1 The **MISMATCH** pair of virus and attachment receptor is ( )
1. FMD virus - Integrins
2. Newcastle Disease virus – Sialic Acid
3. Canine Distemper virus- Ephrin-B2
4. Rabies virus- Nicotinic acetylcholine receptor

2.2 Poultry disease, **NOT** caused by viruses of family *Adenoviridae* ( )
1. Tenosynovitis-arthritis Respiratory disease
2. Quail bronchitis virus infection
3. Hydropericardium syndrome
4. Egg drop syndrome

2.3 Which of the following is **NOT** included in the genus *Morbillivirus* ( )
1. Canine distemper virus
2. Rinderpest virus
3. Bovine respiratory syncytial virus
4. Measles virus

2.4 **MISMATCH** pair about the virus and its preferred cell line for virus culture
1. Peste des petits ruminants virus –Vero ( )
2. Canine Parvovirus – MDBK
3. Blue tongue virus – BHK-21
4. FMD virus - IB-RS-2

2.5 Which is an example of tick-borne flavivirus disease ( )
1. Kyasanur forest disease
2. Dengue virus infection
3. Japanese encephalitis
4. West Nile fever

2.6 The main host of the *Influenzavirus* D is ( )
1. Birds
2. Horses
3. Swine
4. Cattle

2.7 The **INCORRECT** match about pox viruses and their genus is ( )
1. Cowpox - *Orthopoxvirus*
2. Lumpy skin disease virus – *Parapoxvirus*
3. Swine pox - *Suipoxvirus*
4. Fowl pox- *Avipoxvirus*

2.8 **MISMATCH** pairing of viruses and their morphological features ( )
1. Dumbbell shaped core and two lateral bodies - *Poxviridae*
2. Wheel-shaped – *Rotavirus*
3. Herringbone-shaped – *Orthomyxovidae*
4. Bullet Shaped – *Rhabdoviridae*

2.9 The characteristic **UNRELATED** to family *Reteroviridae* ( )
1. Double-stranded RNA as a genome
2. Contains the enzyme reverse transcriptase
3. Causes slowly progressing and immunosuppressive diseases
4. Have enveloped covering an icosahedral capsid

2.10 Which virus family **DOES NOT** include oncogenic viruses ( )
1. *Reteroviridae*
2. *Herpesviridae*
3. *Adenoviridae*
4. *Reoviridae*

2.11 Which among the following is **NOT** a primary lymphoid organ ( )
1. Peyer's patches
2. Bone marrow
3. Spleen
4. Thymus

2.12 Which of the following is **NOT** a monocyte-macrophage lineage cell ( )
1. Mast cells
2. Microglial cell
3. Alveolar macrophage
4. Kupffer cells

2.13 Which is **NOT** a method of monoclonal antibody production ( )
1. Hybridoma production of B cells and Myeloma cells
2. Single B-cell PCR
3. Phage Display technology
4. Peptide scanning technology

2.14 Mark the **MISMATCH** function of immunoglobulin isotype ( )
1. IgG- Crosses the placenta
2. IgA- Protection from helminths in the gut
3. IgM- Complement fixation
4. IgE- Anaphylaxis reaction

2.15 Which among the following immunodiagnostic tests can detect the **LEAST** amount of reactant/ **MOST** sensitive immunodiagnostic test ( )

1. Haemagglutination inhibition test
2. Fluorescent antibody test
3. Chemiluminescent assay
4. ELISA

2.16 The **MISMATCHED** pair of condition and associated hypersensitivity

1. Allergic contact dermatitis – Type I ( )
2. Mismatched blood transfusion - Type II
3. Membranoproliferative glomerulonephritis -Type III
4. Tuberculin reaction – Type IV

2.17 Mark the **MISMATCHED** pair ( )

1. Chondroitin sulphate – Damage-associated molecular pattern
2. Tumour antigen- modified-self type of antigen
3. Bacterial antigen- endogenous antigen
4. Mycolic acid of *Mycobacterium* spp. - Pathogen associated molecular pattern

2.18 The C-3 convertase of the classical complement pathway is ( )

1. C3bBb
2. C4b2a
3. C5b-9
4. C1qrs

2.19 The live attenuated vaccines have all properties, **EXCEPT** ( )

1. These are processed by the MHC-I (cytosolic) pathway
2. These are more immunogenic than killed vaccines
3. These can be stored at room temperature/ cold chain is not required
4. Sometimes these can regain virulence

2.20 Mark the **MISMATCH** pair of recent discoveries and their discoverers in the field of immunology ( )

1. Bruce A. Beutler, Jules A. Hoffmann, Ralph M. Steinman- Innate immune receptors and dendritic cells immunobiology
2. James P. Alison and Tasuku Honjo- Cancer immunotherapy by inhibiting immune checkpoint proteins
3. Katalin Karikó & Drew Weissman- Nucleoside base modifications enabling effective mRNA vaccines
4. Peter C. Doherty and Rolph M Zinkernagel - Phage Display technology

Please write your Roll Number above this line

Q.3 Attempt any ten out of the following twelve questions. Answer of each question should be in 2 to 3 lines. **(10x2.0= 20)**

3.1 MHC restriction of T cells

3.2 Active artificial acquired immunity

3.3 Thymic education of lymphocytes

3.4 Sensitivity and specificity of immunological tests

3.5 Steps of the generation of the Alternative complement C5 convertase in arrow diagrammatic form

3.6 Characteristics of secondary or amnestic immune response

3.7 Four diseases caused by the family *Herpesviridae*

3.8 Cap snatching

3.9 Samples to be collected for the diagnosis of lumpy skin disease virus

3.10 Persistent virus infection

3.11 Genome structure of family *Orthoxyxoviridae*

3.12 Samples to be collected and their intended diagnostic tests in Peste des petits ruminants virus (PPRV) infection

Q.4 Attempt any <u>six</u> out of the following eight questions. Answer of each question should be in 8 to 10 lines. **(6 x 6.0 = 36)**

4.1 Typical structure of an antibody molecule

4.2 Hypersensitivity type IV

4.3 Methods of attenuation of microorganisms for vaccine preparation

Please write your Roll Number above this line

4.4 Structure of T cell receptors

4.5 Classification of the family *Rhabdoviridae* and laboratory diagnosis of rabies virus infection

Please write your Roll Number above this line

4.6 Enlist important viruses of the family *Reoviridae* with their respective diseases

4.7 Strategies for DNA replication in the family *Adenoviridae* and *Anelloviridae* (Previously included in *Circoviridae*)

Please write your Roll Number above this line

4.8 Pathogenesis and microbiological diagnosis of Foot and Mouth Disease Virus infection

Q.5 Answer the following question in 1-2 pages (attempt any two). (2x12.0 = 24)

5.1 Classification (3) and virion structure (3) of the family *Parvoviridae* and describe pathogenesis (3), laboratory diagnosis (2) and vaccination (1) of canine parvovirus infection.

5.2 Classification (3) and virion structure (3) of the family *Paramyxoviridae* and describe aetiology (1), replication strategies (2), pathotyping and laboratory diagnosis (3) of Newcastle disease virus.

5.3 Structure of Major histocompatibility molecules (3+3) and describe the antigen presentation pathways (3+3) in arrow diagrammatic forms.