

**KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES
UNIVERSITY, BIDAR**

Post Graduate Entrance Examinations : 2021-22

PhD in Veterinary Microbiology

Subject Code: P03

HALL TICKET NO.:.....

Date: 10th May 2022

Max Marks : 100

Duration : 2 Hrs.

Choose the correct answer from the four options given under each question and fill the relevant circle with black ball point pen in the OMR Sheet.

Note: 1) Do not use pencil for marking on the OMR Sheet.

2) Marking on the OMR sheet for more than one option for a question will be rendered invalid.

1. If a bacterium takes one minute to divide into two, it takes 59 minutes to fill half of the cup in which they are dividing. How much additional time is required to fill entire cup with that bacterial population, in case that the bacteria are multiplying at same pace.
 - A. 60 minutes
 - B. 30 minutes
 - C. 01 minute
 - D. 118 minutes
2. Gene sequence identity among the bacterial species is usually done to identify
 - A. 16S rRNA
 - B. Fatty acid composition of cell wall
 - C. RFLP of plasmid
 - D. Sugar fermentation test
3. Example for bacterial species that have two circular chromosomes as their genetic materia
 - A. *Staphylococcus* species
 - B. *Borrelia* species
 - C. *Listeria* species
 - D. *Burkholderia* species
4. The mechanism that significantly drives bacterial population for biofilm formation
 - A. Quorum sensing
 - B. Mutation
 - C. Transduction
 - D. Endospore formation
5. Viable bacterial cell population is counted by
 - A. Breed's method
 - B. Pour plate method
 - C. McFarland's standards
 - D. Micro-Kjeldahl method

6. Endo-flagella are present in the bacterial species
- A. *Escherichia coli*
 - B. *Salmonella* serotypes
 - C. *Leptospira* serovars
 - D. *Streptococcus* species
7. Haemagglutination with ovine red cells is found with
- A. *Pasteurella multocida*
 - B. *Mannheimia haemolytica*
 - C. *Bordetella bronchiseptica*
 - D. *Moraxella bovis*
8. The following bacterial species doesn't give positive reaction in CAMP test
- A. *Streptococcus dysgalactiae*
 - B. *Streptococcus agalactiae*
 - C. *Rhodococcus equi*
 - D. *Listeria monocytogenes*
9. One of the following bacterial species grows on MacConkey agar
- A. *Streptococcus agalactiae*
 - B. *Streptococcus dysgalactiae*
 - C. *Streptococcus uberis*
 - D. *Enterococcus faecalis*
10. Yellowish "sulphur granules" in pus of the infected tissue is characteristic feature of
- A. *Actinobacillus lignieresii*
 - B. *Actinomyces bovis*
 - C. *Arcanobacterium (Truperella) pyogenes*
 - D. *Actinobaculum* species
11. Zoospores are characteristic feature of
- A. *Arcanobacterium (Truperella) pyogenes*
 - B. *Dermatophilus congolensis*
 - C. *Dermatophytes*
 - D. *Dichelobacter nodosus*
12. "Medusa head" colonies in *in vitro* culture on bacteriological medium is characteristic feature of
- A. *Brucella abortus*
 - B. *Bacillus anthracis*
 - C. *Borrelia anserina*
 - D. *Bordetella pertussis*

13. Necrotic enteritis in chickens is caused by *Clostridium perfringens*
- A. Type A
 - B. Type B
 - C. Type C
 - D. Type D
14. Lecithinase activity of *Clostridium perfringens* is demonstrated by
- A. Nagler's reaction
 - B. Haemolysis test
 - C. Stormy clot fermentation
 - D. Catalase test
15. Vero toxin of *Escherichia coli* is otherwise called
- A. Shiga toxin
 - B. Shiga and Shiga like toxin
 - C. Neurotoxin
 - D. Haemolysin
16. The *Clostridium* species that lacks flagella
- A. *Clostridium chauvoei*
 - B. *Clostridium novyi*
 - C. *Clostridium perfringens*
 - D. *Clostridium tetani*
17. The *Brucella* species that is capnophilic
- A. *B. melitensis*
 - B. *B. suis*
 - C. *B. ovis*
 - D. *B. canis*
18. One of the following is not a vaccine against brucellosis of *B. abortus*
- A. S19
 - B. Rev 1
 - C. RB51
 - D. 45/20
19. "Bottle brush" type of growth is characteristic feature of rough isolate of the following bacterial species, when it is stab-inoculated into nutrient gelatin and incubated at room temperature for prolonged period
- A. *Campylobacter jejuni*
 - B. *Corynebacterium renale*
 - C. *Erysipelothrix rhusiopathiae*
 - D. *Enterococcus faecalis*

20. The protein A, a surface protein that binds with Fc region of Immunoglobulin G molecules of host to subvert immune response, belongs to
- A. *Streptococcus agalactiae*
 - B. *Staphylococcus aureus*
 - C. *Streptococcus uberis*
 - D. *Streptococcus dysgalactiae*
21. The virulence factor of vegetative cell of *Bacillus anthracis* that binds with the TLR-4 receptor of host immune system
- A. Protective antigen
 - B. Edema factor
 - C. Lethal factor
 - D. Anthrolysin O
22. Summer mastitis in heifers is caused by
- A. *Streptococcus uberis*
 - B. *Corynebacterium bovis*
 - C. *Pseudomonas aeruginosa*
 - D. *Trueperella pyogenes*
23. Based on the activity, the Listeriolysin O of *Listeria monocytogenes* is a
- A. Phospholipase
 - B. Haemolysin
 - C. Metalloprotease
 - D. Lipase
24. Limberneck disease in poultry is caused by
- A. *Clostridium perfringens*
 - B. *Clostridium tetani*
 - C. *Clostridium botulinum*
 - D. *Clostridium novyi*
25. The adhesin of enteropathogenic *Escherichia coli* (EPEC) that is important in binding of EPEC to enterocytes is
- A. Fimbriae
 - B. Porin
 - C. Intimin
 - D. Pili
26. The *Salmonella* serotypes of poultry that are non-motile
- A. *Salmonella* Typhimurium and *Salmonella* Pullorum
 - B. *Salmonella* Pullorum and *Salmonella* Gallinarum
 - C. *Salmonella* Enteritidis and *Salmonella* Gallinarum
 - D. *Salmonella* Typhimurium and *Salmonella* Pullorum
27. One of the following antibiotic doesn't target protein synthesis at ribosomes of bacteria
- A. Erythromycin
 - B. Streptomycin
 - C. Tetracyclin
 - D. Enrofloxacin

28. *Pasteurella multocida* serotype that is responsible for haemorrhagic septicaemia in large ruminants in Asia
- A. B:2
 - B. E:2
 - C. D:2
 - D. 6: E
29. Which of the following is not a primary pathogen for animals
- A. *Brucella abortus*
 - B. *Proteus vulgaris*
 - C. *Pseudomonas aeruginosa*
 - D. *Corynebacterium renale*
30. When glycerol is added to the bacteriological culture medium for cultivating *Mycobacterium* species, it acts as dysgonic for the
- A. *Mycobacterium tuberculosis*
 - B. *Mycobacterium bovis*
 - C. *Mycobacterium avium* subsp. *intracellulae*
 - D. *Mycobacterium avium* subsp. *paratuberculosis*
31. Rickettsia are cultivated by inoculating the sample in
- A. Brain Heart Infusion (BHI) broth
 - B. Tryptic Soy Broth (TSB)
 - C. Egg yolk agar medium
 - D. Embryonated chicken eggs
32. Caseous lymphadenitis in sheep is caused by
- A. Non-nitrate reducing biotype of *Corynebacterium pseudotuberculosis*
 - B. Nitrate reducing biotype of *Corynebacterium pseudotuberculosis*
 - C. *Corynebacterium renale*
 - D. *Corynebacterium pylosum*
33. Bacteriological medium that is specifically used for selective expression of fimbrial antigens of Enterotoxigenic strains of *Escherichia coli*
- A. Eosin Methylene Blue (EMB) agar
 - B. MacConkey agar
 - C. Minca medium
 - D. Rappaport broth
34. Enzootic abortion of ewes (EAE) is sheep in caused by
- A. *Chlamydia abortus*
 - B. *Brucella abortus*
 - C. *Brucella melitensis*
 - D. *Mycoplasma ovis*
35. One of the following is not “sexual spore”
- A. Ascospore
 - B. Basidiospore
 - C. Zygosporangium
 - D. Sporangiospores

36. Cigar shaped macroconidium is found in
A. *Microsporum gypseum*
B. *Microsporum canis*
C. *Trichophyton mentagrophytes*
D. *Microsporum nanum*
37. Asexual form of conidial fungus is referred as
A. Anamorph
B. Teleomorph
C. Sporangiomorph
D. Ascomorph
38. The fungal spores that are formed and subsequently released during the process of hyphal fragmentation are
A. Zygosporos
B. Chlamydospore
C. Arthrospore
D. Conidia
39. The phenol oxidase enzyme of the following yeast degrades catecholamine of hosts resulting in accumulation of melanin in the yeast cells for protection against toxic effects of free radicals in host
A. *Candida albicans*
B. *Candida tropicalis*
C. *Cryptococcus neoformans*
D. *Malassezia pachydermatis*
40. The serotype of *Yersinia enterocolitica* that shares common antigens with *Brucella* species
A. O:7
B. O:5
C. O:9
D. O:3
41. Equine epizootic lymphangitis is caused by
A. *Histoplasma capsulatum* var. *capsulatum*
B. *Histoplasma capsulatum* var. *farciminosum*
C. *Histoplasma capsulatum* var. *duboisii*
D. *Burkholderia mallei*
42. Bird seed agar is used for cultivation of
A. *Cryptococcus neoformans*
B. *Coccidioides immitis*
C. *Chlamydia psittaci*
D. *Aspergillus species*

43. Tumour like granulomatous lesions caused by saprophyte fungi in a host are
- A. Mycoma
 - B. Mycoblastoma
 - C. Mycetoma
 - D. Hypermycoma
44. Pitting of Loeffler's serum slope within 24 hrs. of bacteria inoculation is characteristic feature for provisional identification of
- A. *Actinobaculum suis*
 - B. *Arcanobacterium (Truperella) pyogenes*
 - C. *Erysipelothrix rhusiopathiae*
 - D. *Corynebacterium ovis*
45. On blood agar *Pasteurella multocida* produces
- A. Incomplete haemolysis
 - B. Complete haemolysis
 - C. Double haemolysis
 - D. No haemolysis
46. Fruity grape like odour is smelt with the bacterial cultures of
- A. *Pseudomonas* species
 - B. *Salmonella* serotypes
 - C. *Escherichia coli*
 - D. *Campylobacter* species
47. Infectious extra-cellular form of *Chlamydia* is called as
- A. Ciliary body
 - B. Basal body
 - C. Elementary body
 - D. Reticulate body
48. Epsilometer test is used for
- A. Detecting epsilon toxin concentration in enterotoxaemia cases of sheep
 - B. Determination of pro-toxin vs toxin levels of epsilon toxin
 - C. Turbidity of bacterial cultures
 - D. Anti-microbial susceptibility testing
49. Bovine farcy is caused by
- A. *Nocardia farcinica*
 - B. *Burkholderia mallei*
 - C. *Pseudomonas aeruginosa*
 - D. *Dermatophilus congolensis*
50. Kume serotyping scheme is followed for
- A. *Ornithobacterium rhinotracheale*
 - B. *Avibacterium paragallinarum*
 - C. *Mycoplasma gallisepticum*
 - D. *Salmonella* serotypes

51. Example for primary animal cell culture
- A. Vero cells.
 - B. BHK21
 - C. Chicken embryo fibroblasts
 - D. MDCK
52. The infectivity of virus is expressed in
- A. TCID₅₀/ml
 - B. EID₅₀/ml
 - C. PFU₅₀/ml
 - D. TCID₅₀/ml or EID₅₀/ml or PFU₅₀/ml
53. The tendency of a virus to infect particular tissue in the body of a host is called
- A. Tethering
 - B. Attachment
 - C. Tropism
 - D. Affinity
54. Internal Ribosomal Entry Site (IRES) of viral genome assumes significance in the replication of
- A. Bovine Herpes Virus (BHV) 1
 - B. Foot and Mouth Disease (FMD) virus
 - C. Rabies virus
 - D. Buffalopox virus
55. Immunogenic protein of rabies virus is
- A. Haemagglutinin
 - B. Neuraminidase
 - C. G protein
 - D. F protein
56. Reverse transcriptase (RT) enzyme of viruses that belong to *Retroviridae* family is
- A. DNA dependent RNA polymerase
 - B. RNA dependent DNA polymerase
 - C. Gyrase
 - D. Integrase
57. Certain viral infections may be responsible for autoimmune diseases in humans and animals. This phenomenon is usually referred as
- A. Cytopathy
 - B. Polymorphism
 - C. Molecular mimicry
 - D. Antigenic shift

58. The Toll Like receptor (TLR) in the host that doesn't have much significance in anti-viral immunity
- A. TLR 7
 - B. TLR 8
 - C. TLR 9
 - D. TLR 5
59. In virus infected cells natural killer (NK) cell mediated lysis is promoted by reduced expression of
- A. MHC I antigens
 - B. MHC II antigens
 - C. MHC III antigens
 - D. Integrins
60. Buffalopox virus is antigenically closely related to
- A. Cowpox virus
 - B. Smallpox virus
 - C. Vaccinia virus
 - D. Monkeypox virus
61. Intracytoplasmic inclusion bodies present in the fowlpox virus infected cells are called
- A. Negri bodies
 - B. Bollinger bodies
 - C. Metachromatic bodies
 - D. Guarneri bodies
62. The DNA virus of veterinary importance that is transmitted by ticks
- A. Canine adenovirus 1
 - B. Marek's disease virus
 - C. Blue tongue virus
 - D. African swine fever virus
63. In many herpes virus infections the characteristic inclusion bodies found in cell cultures are
- A. Intra cytoplasmic
 - B. Eosinophilic intranuclear
 - C. Basophilic intranuclear
 - D. Diffused cytoplasmic
64. In parvovirus capsid nearly 90% of viral protein is
- A. VP1
 - B. VP2
 - C. VP3
 - D. VP4

65. Chicken anaemia virus belongs to the genus
- A. Cytomegalovirus
 - B. Aviadenovirus
 - C. Gyrovirus
 - D. Mardivirus
66. The retrovirus gene that codes for reverse transcriptase and integrase enzymes is
- A. *gag*
 - B. *pol*
 - C. *pro*
 - D. *env*
67. Coggins test is used for diagnosis of
- A. Marek's disease
 - B. Equine infectious anaemia
 - C. Avian leukosis
 - D. West Nile virus
68. The number of double stranded RNA gene segments present in Blue Tongue virus is
- A. 9 segments
 - B. 10 segments
 - C. 11 segments
 - D. 12 segments
69. Group specific antigen of Blue Tongue virus which is routinely detected in serological tests for diagnosis is
- A. VP2
 - B' VP5
 - C. VP7
 - D. VP1
70. The number of serotypes reported for Infectious Bursal Disease (IBD) virus
- A. 3
 - B. 2
 - C. 1
 - D. 4
71. The intra cerebral pathogenicity index in day old chickens for defining the New Castle Disease virus infection is
- A. 0.2
 - B. 0.5
 - C. 0.6
 - D. 0.7
72. The rabies virus strain that was used for preparation of anti-rabies vaccine by passaging in embryonated chicken eggs
- A. Sterne
 - B. Flury
 - C. Pasteur
 - D. Munich

73. Find the odd one out
- A. Smallpox virus
 - B. Fowlpox virus
 - C. Chickenpox virus
 - D. Monkeypox virus
74. The receptor for influenza virus in the gut epithelium of ducks is
- A. SA α 2,3 gal
 - B. SA α 2,6 gal
 - C. SA α 3,2 gal
 - D. SA α 6,2 gal
75. A tegument is present in the virion structure of
- A. Herpes virus
 - B. Retrovirus
 - C. Parvovirus
 - D. Pox virus
76. Crimean Congo haemorrhagic fever virus belongs to the family
- A. *Filoviridae*
 - B. *Bunyaviridae*
 - C. *Arenaviridae*
 - D. *Flaviviridae*
77. Avian infectious laryngotracheitis (ILT) virus is cultivated in chicken embryonated eggs by passaging through
- A. Allantoic route
 - B. Yolk sac route
 - C. Chorio Allantoic Membrane (CAM) route
 - D. Intravenous route
78. Avian infectious bronchitis (IB) virus is cultivated in chicken embryonated eggs by passaging through
- A. Allantoic route
 - B. Yolk sac route
 - C. Chorio Allantoic Membrane (CAM) route
 - D. Intravenous route
79. Antibodies to the following viral non-structural protein (NSP) that is reliably used in serological testing of ruminants for Foot and Mouth Disease (FMD) virus infection
- A. 3A
 - B. 3B
 - C. 3D
 - D. 3ABC

80. Latency (latent infection in hosts) is the characteristic feature of the viruses that belong to the family
- A. *Retroviridae*
 - B. *Herpesviridae*
 - C. *Reoviridae*
 - D. *Paramyxoviridae*
81. Best animal model disease for pathogenesis of HIV-AIDS in humans
- A. Bovine immune deficiency virus
 - B. Feline immunodeficiency virus
 - C. Equine infectious anaemia
 - D. Maide Visna virus
82. Virus that multiplies in the macrophages of the host
- A. Rabies virus
 - B. Bovine Herpes Virus (BHV) 1
 - C. Canine Distemper virus
 - D. Hog cholera virus
83. Cycling or dividing cells assume significance in replication and pathogenesis of
- A. Rotavirus
 - B. Herpes virus
 - C. Poxvirus
 - D. Parvovirus
84. Example for food borne viral zoonosis
- A. Buffalopox virus
 - B. Tick borne encephalitis virus
 - C. Rabies virus
 - D. Severe Acute Respiratory Syndrome (SARS) virus
85. The immunoglobulin isotype that is predominant during primary humoral immune response in a host
- A. IgG
 - B. IgA
 - C. IgM
 - D. IgE
86. The following is not a cell surface Toll like receptor (TLR)
- A. TLR1
 - B. TLR4
 - C. TLR5
 - D. TLR8
87. The chemokine that activates neutrophils for chemotaxis is
- A. Interleukin-1
 - B. Interleukin-6
 - C. Interleukin-8
 - D. Interleukin-2

88. The Toll like receptor (TLR) with which the lipopolysaccharide of Gram negative bacteria binds during innate immune response
- A. TLR4
 - B. TLR7
 - C. TLR8
 - D. TLR9
89. Phagocytes with sustained phagocytic activity
- A. Neutrophils
 - B. Eosinophils
 - C. Mast cells
 - D. Macrophages
90. Immunomodulatory cytokine
- A. Interferon α
 - B. Interferon β
 - C. Interferon γ
 - D. Tumour necrosis factor α
91. Animal species in which cortex is oriented towards centre and medulla is oriented towards periphery in a lymphnode is
- A. Cattle
 - B. Horse
 - C. Rabbit
 - D. Pig
92. Following microbial activation, dendritic cells 1 (DC1) population secretes the cytokine
- A. IL-6
 - B. IL-12
 - C. IL-1
 - D. IL10
93. Transporter for antigenic processing (TAP) proteins are associated with
- A. MHC Class I pathway
 - B. MHC Class II pathway
 - C. Both MHC Class I and Class II pathways
 - D. MHC Class III pathway
94. The cytokine of major significance that acts on Th17 cells and increase the expression of Interleukin 17 (IL-17)
- A. Interleukin-2
 - B. Interferon γ
 - C. Interleukin-23
 - D. Interleukin-4

95. In the production of monoclonal antibodies by hybridoma technology, the unfused myeloma cells that are cultured in Hypoxanthine, Aminopterin and Thymidine are eliminated by the action of
- A. Hypoxanthine
 - B. Aminopterin
 - C. Thymidine
 - D. Polyethylene Glycol
96. The animal species in which immunoglobulin G subtypes IgG2 and IgG3 don't contain light chains
- A. Sheep
 - B. Tiger
 - C. Chickens
 - D. Camels
97. Pseudogenes play significant role in the generation of antibody diversity in
- A. Rabbit
 - B. Ruminants
 - C. Chicken
 - D. Cat
98. The animals with relatively homogenous genetic constitution of Major Histocompatibility complex (MHC) that makes them more susceptible to infectious diseases
- A. Bovines
 - B. Equines
 - C. Felines
 - D. Canines
99. All the nucleated cells in a host express the following antigens on their cell surface
- A. MHC I antigens
 - B. MHC II antigens
 - C. Both MHC I and MHC II antigens
 - D. MHC I, MHC II and MHC III antigens
100. Example for classic C-type lectin of innate immunity system
- A. Mannose receptor
 - B. Dectin-1
 - C. CD14
 - D. CR3
