LEC 2 Q- VIROLOGY:

1. **What is a primary basis for the current classification of viruses?**

   A) Host preference
   B) Molecular biology
   C) Environmental factors
   D) Transmission methods

2. **Which of the following is NOT a characteristic used to classify viruses?**

   A) Nucleic acid type
   B) Symmetry of the capsid
   C) Color of the virus
   D) Presence of an envelope

3. **Retroviruses are unique because they can:**

   A) Only infect bacteria
   B) Convert RNA back into DNA
   C) Replicate without a host
   D) Have multiple capsid shapes

4. **What type of viruses exclusively infect bacteria?**

   A) Retroviruses
   B) Bacteriophages
   C) Enveloped viruses
   D) RNA viruses

5. **During which step of viral replication is the viral genome released from the capsid?** A) Adsorption
   B) Entry
   C) Uncoating
   D) Assembly

6. **What distinguishes positive-sense RNA viruses from negative-sense RNA viruses?** A) Positive-sense RNA cannot be translated
   B) Negative-sense RNA acts as mRNA
   C) Positive-sense RNA is directly translated into proteins
   D) Negative-sense RNA is never replicated

7. **Which of the following viruses is known to potentially cause cancer?**

   A) Influenza
   B) Human Papilloma Virus

C) Hepatitis A
D) Norwalk

8. **What process do mRNA vaccines utilize to elicit an immune response?**

   A) They introduce live pathogens into the body.
   B) They deliver genetic instructions to cells.
   C) They replicate the viral genome within the body.
   D) They destroy the virus immediately upon entry.

9. **How do enveloped viruses typically exit the host cell?**

   A) By lysing the cell
   B) By budding from the plasma membrane
   C) Through direct cell fusion
   D) By remaining inside until the host dies

10. **Which stage of the viral life cycle involves the synthesis of viral components?**

    A) Adsorption
    B) Transcription
    C) Assembly
    D) Release

Answers

1. B
2. C
3. B
4. B
5. C
6. C
7. B
8. B
9. B
10. B

11. **Which of the following best describes the "eclipse period" in viral replication?**

    A) The period of viral assembly
    B) The time when the virion is undetectable and non-infectious
    C) The stage where the virus enters the host cell
    D) The phase of uncoating

12. **What characteristic is true for all DNA viruses?**

    A) They always cause severe disease.
    B) They replicate their RNA in the cytoplasm.

C) They require the host's nucleus for replication.
D) They can switch to RNA during replication.

13. **Which step of the viral replication cycle involves specific interactions between viral surface proteins and host cell receptors?**

A) Entry
B) Adsorption
C) Assembly
D) Release

14. **What role do spikes play in viral attachment?**

A) They help in viral uncoating.
B) They allow the virus to replicate in the host.
C) They facilitate the attachment to host cell membranes.
D) They are involved in the release of new virions.

15. **How do non-enveloped viruses typically affect the host cell upon release?**

A) They bud off without causing damage.
B) They usually cause the host cell to lyse.
C) They integrate into the host's genome.
D) They convert the host cell into a factory for protein synthesis.

16. **What is a common feature of RNA viruses regarding their replication?**

A) They always require a host cell's nucleus.
B) They encode their own polymerases for replication.
C) They can only replicate in bacterial hosts.
D) They do not produce proteins.

17. **Which of the following is a key factor in the pathogenicity of viruses?**

A) The structure of the capsid
B) The interplay between viral and host factors
C) The presence of an envelope
D) The size of the virus

18. **What distinguishes the assembly of enveloped viruses from non-enveloped viruses?**

A) Enveloped viruses do not form capsids.
B) Enveloped viruses require the host's plasma membrane for release.
C) Non-enveloped viruses are always larger than enveloped viruses.
D) Enveloped viruses can only be assembled in the cytoplasm.

19. **What is the role of viral polymerases in the replication of RNA viruses?**

A) They help in the synthesis of host proteins.
B) They replicate the viral RNA genome.
C) They assist in packaging the virus.
D) They are involved in viral uncoating.

20. **Why are most viral infections considered subclinical?**

A) They are always asymptomatic.
B) They can lead to severe disease in all cases.
C) They do not trigger any immune response.
D) They result in noticeable symptoms in all infected individuals.

Answers

11. B
12. C
13. B
14. C
15. B
16. B
17. B
18. B
19. B
20. A

21. **What is a defining characteristic of retroviruses?**

A) They contain only DNA.
B) They can convert RNA into DNA.
C) They exclusively infect bacterial cells.
D) They replicate in the cytoplasm only.

22. **Which type of virus is known for causing diseases such as warts and cervical cancer?**

A) Adenoviruses
B) Poxviruses
C) Human Papilloma Virus (HPV)
D) Herpesviridae

23. **What mechanism do enveloped viruses primarily use to enter host cells?**

A) Lysis
B) Endocytosis
C) Direct fusion with the membrane
D) Random collision

24. **What type of viral RNA serves as mRNA for immediate translation?**

A) Negative-sense RNA
B) Double-stranded RNA
C) Positive-sense RNA
D) Single-stranded DNA

25. **What happens during the release phase of viral replication for enveloped viruses?**

A) The host cell dies immediately.
B) They typically bud off without killing the host cell.
C) They require cellular enzymes to exit.
D) They infect neighboring cells through direct contact.

26. **What is the main role of host cell enzymes in the uncoating process?**

A) To synthesize new viral proteins
B) To strip the viral capsid and release the genome
C) To facilitate viral entry into the nucleus
D) To replicate the viral RNA

27. **Which viruses are classified as having double-stranded DNA?**

A) Influenza and Measles
B) Hepatitis B and Adenovirus
C) Norwalk and Rotavirus
D) HIV and RSV

28. **What is the significance of the term "tropism" in virology?**

A) It refers to the size of the virus.
B) It describes the virus's ability to survive in the environment.
C) It indicates the virus's preference for certain host cells.
D) It denotes the viral replication rate.

29. **How does the integration of viral RNA into host DNA potentially affect the host?**

A) It leads to immediate viral lysis.
B) It can cause mutations and increase cancer risk.
C) It has no effect on the host DNA.
D) It protects the host from future infections.

30. **Which of the following describes the relationship between viral infections and host immune responses?**

A) All viral infections cause immediate immune responses.
B) Subclinical infections can help develop immunity without symptoms.
C) Viruses never trigger immune responses.
D) Host immune responses always eliminate the virus.

Answers

21. B
22. C
23. C
24. C
25. B
26. B
27. B
28. C
29. B
30. B

31. **What unique feature allows retroviruses to integrate their genetic material into the host genome?**

    A) The presence of a viral envelope
    B) The action of reverse transcriptase
    C) The use of host DNA polymerase
    D) The production of negative-sense RNA

32. **During the assembly of new viruses, where do most enveloped viruses acquire their envelope?**

    A) From the host cell's cytoplasm
    B) Directly from the nucleus
    C) By budding from the plasma membrane
    D) From lysosomes within the host

33. **Which of the following statements about viral replication is correct?**

    A) Non-enveloped viruses exclusively use endocytosis for entry.
    B) All viruses require the host cell's nucleus for replication.
    C) The release of non-enveloped viruses typically results in cell lysis.
    D) Viruses do not require host machinery for protein synthesis.

34. **In the context of viral pathogenesis, what does the term "subclinical infection" imply?**

    A) The virus is cleared without any immune response.
    B) The host experiences severe symptoms.
    C) The infection occurs without noticeable symptoms, but may elicit an immune response.
    D) The virus cannot infect the host’s cells effectively.

35. **Which of the following processes primarily differentiates DNA virus replication from RNA virus replication?**

    A) The requirement for a nuclear entry
    B) The presence of an envelope

C) The method of protein synthesis
D) The number of viral components synthesized

36. **What is a key consequence of a virus utilizing host cell enzymes for replication?**

A) The virus becomes independent of the host cell's metabolism.
B) It increases the potential for viral mutations.
C) The virus can replicate faster than DNA viruses.
D) The host cell will always be destroyed.

37. **How does the presence of spikes on a virus influence its ability to infect host cells?**

A) They protect the virus from the immune system.
B) They facilitate the random collision with host cells.
C) They allow for specific binding to host cell receptors, increasing infection efficiency.
D) They assist in the uncoating process within the host cell.

38. **What potential impact do bacteriophages have on the pathogenicity of the bacteria they infect?**

A) They make all bacteria non-pathogenic.
B) They can enhance the pathogenicity of previously non-pathogenic bacteria.
C) They prevent all viral infections in bacteria.
D) They have no impact on bacterial behavior.

39. **Which statement accurately describes the viral replication cycle?**

A) The assembly of viruses occurs exclusively in the nucleus.
B) The uncoating process is essential for the release of new virions.
C) Viral proteins are synthesized during the transcription phase.
D) The entry phase always involves the destruction of host cell membranes.

40. **What differentiates positive-sense RNA viruses from their negative-sense counterparts in terms of their replication process?**

A) Positive-sense RNA viruses require the host's nucleus for replication.
B) Positive-sense RNA can be immediately translated into proteins, whereas negative-sense must first convert to positive-sense RNA.
C) Negative-sense RNA viruses replicate faster than positive-sense RNA viruses.
D) Positive-sense RNA viruses cannot replicate without host enzymes.

Answers

31. B
32. C
33. C

34. C
35. A
36. B
37. C
38. B
39. C
40. B

41. **Which characteristic of viruses is crucial for their classification based on molecular biology?**

    A) The presence of an envelope
    B) The type of nucleic acid (DNA or RNA)
    C) The size of the virus
    D) The method of transmission

42. **How do viruses ensure their survival and replication within a host cell?**

    A) By encoding metabolic pathways
    B) By hijacking the host cell's machinery
    C) By directly entering the host genome
    D) By producing antiviral proteins

43. **What is the main function of viral replicases in the replication of RNA viruses?**

    A) To facilitate the uncoating of the virus
    B) To synthesize new viral genomes from RNA templates
    C) To aid in the assembly of viral components
    D) To modify host cell enzymes

44. **Which of the following statements is true regarding the uncoating process?**

    A) It is the last step before viral release.
    B) It occurs exclusively in the cytoplasm.
    C) It requires specific host cell enzymes to strip the capsid.
    D) It is not necessary for enveloped viruses.

45. **What role does the host's immune response play in subclinical infections?**

    A) It completely eliminates the virus without any symptoms.
    B) It often fails to respond, allowing for chronic infection.
    C) It can provide immunity without causing observable symptoms.
    D) It always results in severe disease symptoms.

46. **Which viral property is likely to influence the effectiveness of mRNA vaccines?**

    A) The ability to replicate within the host
    B) The presence of specific antigens on the virus
    C) The size of the viral genome
    D) The type of host cells the virus can infect

47. **In terms of viral pathogenicity, how do some viruses alter host cell functions?**

    A) By directly killing the host cell upon entry
    B) By integrating into the host DNA and disrupting normal functions
    C) By producing enzymes that enhance cellular metabolism
    D) By relying solely on the host's immune response

48. **What mechanism do bacteriophages utilize to enhance bacterial pathogenicity?**

    A) By introducing antiviral genes
    B) By transferring virulence factors through transduction
    C) By directly killing the bacteria
    D) By promoting bacterial resistance to antibiotics

49. **Which type of virus is more likely to cause persistent infections due to its integration into the host genome?**

    A) Non-enveloped DNA viruses
    B) Positive-sense RNA viruses
    C) Retroviruses
    D) Bacteriophages

50. **How does the viral assembly process differ for enveloped versus non-enveloped viruses?**

    A) Enveloped viruses do not require structural proteins for assembly.
    B) Non-enveloped viruses typically bud off from the nuclear membrane.
    C) Enveloped viruses acquire their envelope during the release process, while non-enveloped viruses rely on cell lysis.
    D) Both types of viruses assemble exclusively in the cytoplasm.

Answers

41. B
42. B
43. B
44. C
45. C

46. B
47. B
48. B
49. C
50. C

51. **What is a primary factor that makes historical classifications of viruses inconsistent?**

    A) Limited understanding of viral structure
    B) Overlapping categories due to multi-host infections
    C) Inadequate technology for genetic analysis
    D) Lack of defined viral families

52. **Which viral characteristic is constant and does not change during its life cycle?**

    A) The presence of nucleic acid
    B) The capsid shape
    C) The viral genome size
    D) The ability to infect multiple hosts

53. **What defines the process of "tropism" in viral infections?**

    A) The mechanism of viral entry
    B) The specific cell types that a virus can infect
    C) The environmental conditions required for viral survival
    D) The immune response triggered by the virus

54. **What role do host cell ribosomes play during viral replication?**

    A) They synthesize viral nucleic acids.
    B) They are involved in the assembly of viral particles.
    C) They translate viral mRNA into proteins.
    D) They help in the uncoating of the virus.

55. **Which type of virus can reverse transcribe its RNA into DNA?**

    A) DNA viruses
    B) Positive-sense RNA viruses
    C) Negative-sense RNA viruses
    D) Retroviruses

56. **What is the typical outcome for non-enveloped viruses upon release from the host cell?**

    A) They bud off without harming the cell.
    B) They cause cell lysis, resulting in host cell death.
    C) They remain dormant within the cell.
    D) They replicate in neighboring cells without damage.

57. **Which step in the viral replication cycle follows uncoating?**

    A) Adsorption
    B) Assembly
    C) Transcription
    D) Entry

58. **In the context of viral pathogenesis, what does the term "viral load" refer to?**

    A) The number of viral particles released from an infected cell
    B) The total amount of virus present in the host
    C) The immune response generated against the virus
    D) The severity of symptoms experienced by the host

59. **Which of the following describes the significance of mRNA vaccines during the COVID-19 pandemic?**

    A) They eliminate the need for an immune response.
    B) They directly introduce the virus into the body.
    C) They instruct cells to produce viral proteins to elicit an immune response.
    D) They contain live attenuated viruses to provoke immunity.

60. **What is a major risk factor associated with infections from certain DNA viruses, such as HPV?**

    A) Immediate lysis of host cells
    B) Development of chronic infections leading to cancer
    C) High mutation rates during replication
    D) Inability to trigger an immune response

Answers

51. B
52. B
53. B
54. C
55. D
56. B
57. C
58. B
59. C
60. B

61. **What is a key reason why some viruses can cause disease even in healthy hosts?**

    A) They evolve rapidly.
    B) They can remain dormant for long periods.

C) They may utilize host factors to enhance virulence.
D) They are transmitted via vectors.

62. **Which factor is crucial in the classification of viruses based on their genetic material?**

A) The presence of an envelope
B) The symmetry of the capsid
C) The type of nucleic acid (DNA or RNA)
D) The host species they infect

63. **In terms of viral pathogenesis, what distinguishes a pathogenic virus from a non-pathogenic virus?**

A) The type of host cells they infect
B) Their ability to replicate efficiently
C) The presence of specific genes that enhance virulence
D) Their size and structural complexity

64. **What distinguishes the replication strategy of positive-sense RNA viruses from that of negative-sense RNA viruses?**

A) Positive-sense RNA can be immediately translated; negative-sense RNA must first be converted to positive-sense.
B) Positive-sense RNA requires the nucleus for replication; negative-sense does not.
C) Positive-sense RNA viruses are always enveloped; negative-sense are not.
D) Positive-sense RNA viruses can only replicate in bacteria; negative-sense can replicate in eukaryotes.

65. **Which stage of viral replication is characterized by the release of the viral genome into the host cell's cytoplasm?**

A) Entry
B) Uncoating
C) Assembly
D) Release

66. **What is a common method by which enveloped viruses acquire their envelopes?**

A) By budding from the endoplasmic reticulum
B) By incorporating host cell membrane components during the release process
C) By synthesizing their own lipid membranes
D) By forming vesicles in the cytoplasm

67. **Which statement best describes the viral life cycle in terms of host cell interaction?**

A) Viruses always kill the host cell upon entry.
B) Some viruses can establish latency within host cells.
C) All viruses replicate outside of host cells.
D) Viruses do not utilize any host cell machinery.

68. **What is the significance of the term "viral tropism"?**

A) It refers to the environmental conditions favorable for viral survival.
B) It describes the specific tissues or cell types a virus can infect.
C) It indicates the rate of viral replication.
D) It denotes the method of viral transmission.

69. **How do mRNA vaccines help the immune system recognize viruses?**

A) They directly kill the virus in the bloodstream.
B) They teach cells to produce viral proteins that stimulate an immune response.
C) They introduce live viruses into the body to elicit immunity.
D) They alter the host DNA to create immunity.

70. **Which of the following best explains the clinical significance of subclinical viral infections?**

A) They are harmless and have no impact on the host.
B) They allow for immune system training without presenting symptoms.
C) They always lead to chronic diseases later in life.
D) They do not engage the immune system at all.

Answers

61. C
62. C
63. C
64. A
65. B
66. B
67. B
68. B
69. B
70. B

71. **Which mechanism allows retroviruses to effectively integrate into the host genome?**

A) RNA splicing
B) Reverse transcription
C) RNA-dependent RNA polymerase
D) Gene editing

72. **What distinguishes the capsid structure of viruses that have icosahedral symmetry from those with helical symmetry?**

A) Icosahedral viruses are always enveloped, while helical viruses are not.
B) Icosahedral capsids are composed of identical protein subunits arranged in a symmetrical pattern, while helical capsids are cylindrical.
C) Helical viruses can only infect prokaryotic cells, whereas icosahedral viruses infect eukaryotic cells.
D) Icosahedral viruses replicate faster than helical viruses.

73. **What is the primary reason some viruses, such as certain DNA viruses, are more likely to cause cancer?**

A) They replicate exclusively in the cytoplasm.
B) They directly interact with the host's genetic material, leading to mutations.
C) They require a vector for transmission.
D) They have a higher mutation rate.

74. **Which characteristic of a virus can directly affect its mode of transmission?**

A) The presence of an envelope
B) The nucleic acid type
C) The capsid symmetry
D) The replication cycle length

75. **What occurs during the eclipse period of viral replication?**

A) The virus is fully assembled and ready for release.
B) The virus has entered the host cell but cannot be detected.
C) The viral genome is actively replicating in the host cell.
D) The host cell begins to show symptoms of infection.

76. **Which of the following statements accurately reflects the role of lysosomes during the uncoating phase?**

A) Lysosomes enhance the binding of the virus to the host cell membrane.
B) Lysosomes help in the synthesis of viral proteins.
C) Lysosomes facilitate the breakdown of the viral capsid.
D) Lysosomes prevent viral replication.

77. **How do positive-sense RNA viruses differ in their initial interaction with host cells compared to negative-sense RNA viruses?**

A) Positive-sense RNA viruses require host ribosomes for protein synthesis immediately upon entry.
B) Negative-sense RNA viruses replicate only in the nucleus, while positive-sense can replicate in the cytoplasm.
C) Positive-sense RNA viruses can be directly translated into proteins; negative-sense must first be converted.

D) Positive-sense RNA viruses exclusively infect bacteria, whereas negative-sense do not.

78. **What implication does the presence of spikes on a virus have for its potential to evade the immune response?**

    A) Spikes increase the virus's ability to bind to antibodies.
    B) Spikes enhance the virus's ability to enter the host cell but do not aid in immune evasion.
    C) Spikes can mutate rapidly, allowing the virus to escape recognition by the host's immune system.
    D) Spikes are irrelevant to immune evasion and solely function in attachment.

79. **In what way can the mechanism of infection by bacteriophages differ from that of eukaryotic viruses?**

    A) Bacteriophages always cause cell lysis upon entry, while eukaryotic viruses do not.
    B) Bacteriophages inject their genetic material directly into the host, whereas eukaryotic viruses rely on endocytosis.
    C) Eukaryotic viruses can only replicate in the nucleus, while bacteriophages do not have this requirement.
    D) Eukaryotic viruses utilize host cell enzymes exclusively for replication, whereas bacteriophages do not.

80. **What is a critical factor that can lead to an increase in pathogenicity of a virus after it infects a host?**

    A) The size of the viral genome
    B) The viral replication rate
    C) The genetic exchange through recombination or reassortment
    D) The presence of an envelope

Answers

71. B
72. B
73. B
74. A
75. B
76. C
77. C
78. C
79. B
80. C

New High-Yield Multiple-Choice Questions

81. **Which aspect of viral structure is critical for determining the virus's mode of entry into host cells?** A) The type of nucleic acid

B) The symmetry of the capsid
C) The presence and structure of surface proteins (spikes)
D) The size of the virus

82. **What is a significant consequence of a virus utilizing multiple host cell receptors for entry?** A) It can infect a wider variety of host organisms.
B) It decreases the chance of viral transmission.
C) It makes the virus less pathogenic.
D) It limits the virus to specific cell types.
83. **In the context of viral replication, what role does the host cell's cytoplasm play for RNA viruses?** A) It is where viral RNA is transcribed into DNA.
B) It serves as the primary site for translation of viral proteins.
C) It is involved in packaging viral genomes into new capsids.
D) It facilitates the uncoating of viral nucleic acids.
84. **How does the mechanism of entry for enveloped viruses differ from that of non-enveloped viruses?** A) Enveloped viruses require only receptor-mediated endocytosis.
B) Non-enveloped viruses can only enter through direct fusion.
C) Enveloped viruses can fuse with the host membrane, while non-enveloped viruses typically enter via endocytosis.
D) Both types of viruses use the same entry mechanisms.
85. **What is the role of viral proteins synthesized in the host cell during the replication cycle?** A) They assist in the entry of the virus into new host cells.
B) They are essential for assembling new viral particles.
C) They serve to neutralize host immune responses.
D) They provide energy for viral replication.
86. **Which statement best characterizes the release of enveloped viruses from host cells?** A) They always result in cell death.
B) They can be released by budding without necessarily killing the host cell.
C) They are released only through exocytosis.
D) They require specific host cell lysis to be liberated.
87. **What can potentially happen to the host's DNA when a DNA virus integrates into the host genome?** A) The host DNA is replicated without alteration.
B) It may cause mutations or disrupt normal cellular functions.
C) The viral DNA is immediately destroyed by the host.
D) The integration process enhances the host's immune response.
88. **What is the significance of the viral "eclipse period" in the context of viral infections?** A) It represents the phase when the virus is actively replicating.
B) It indicates the period during which viral particles are released.
C) It is when the virus is undetectable and unable to infect other cells.
D) It is the time required for the virus to adapt to a new host.
89. **Which factor can lead to the development of viral resistance in a population of viruses?** A) Increased viral replication speed
B) Host immune responses
C) Genetic mutations during replication
D) Use of antiviral medications
90. **How does the ability of viruses to undergo genetic reassortment impact their pathogenicity?** A) It decreases their ability to infect hosts.
B) It allows them to evade immune responses by producing new viral strains.

C) It stabilizes their genome, making them less variable.
D) It enhances their interaction with host cellular machinery.

Answers

81. C
82. A
83. B
84. C
85. B
86. B
87. B
88. C
89. C
90. B

91. **What is the primary factor that differentiates the replication strategy of DNA viruses from that of RNA viruses?**

    A) DNA viruses must replicate in the nucleus, while RNA viruses can replicate in the cytoplasm.
    B) DNA viruses always require a host enzyme for replication, while RNA viruses do not.
    C) RNA viruses can only infect animal cells, whereas DNA viruses can infect both plant and animal cells.
    D) DNA viruses utilize a lytic cycle exclusively, while RNA viruses do not.

92. **What can trigger a subclinical viral infection to progress to a more severe disease?**

    A) The initial replication rate of the virus
    B) The immune status of the host
    C) The presence of co-infections
    D) All of the above

93. **Which of the following statements best describes how mRNA vaccines function?**

    A) They contain live attenuated viruses that induce an immune response.
    B) They provide the immune system with direct antibodies against the virus.
    C) They instruct cells to produce a viral protein that triggers an immune response.
    D) They modify the host DNA to confer immunity.

94. **What is one of the primary roles of reverse transcriptase in retroviruses?**

    A) It facilitates the assembly of the viral capsid.
    B) It converts viral RNA into DNA for integration into the host genome.
    C) It aids in the translation of viral proteins.
    D) It allows the virus to evade host immune responses.

95. **How can bacteriophages contribute to the pathogenicity of the bacteria they infect?**

A) By directly killing the bacteria upon entry.
B) By introducing new genetic material that can enhance virulence factors.
C) By inhibiting bacterial replication.
D) By preventing the bacteria from producing toxins.

96. **What critical feature of the viral envelope influences the virus's ability to infect host cells?**

A) Its size
B) Its lipid composition
C) The presence of glycoproteins
D) Its shape

97. **In the assembly phase of viral replication, where do newly synthesized viral components typically come together?**

A) Exclusively in the host nucleus
B) Primarily in the cytoplasm or at the plasma membrane
C) Within lysosomes
D) At the endoplasmic reticulum only

98. **Which factor most significantly impacts the duration of the viral replication cycle?**

A) The type of host cell
B) The environmental conditions (temperature, pH)
C) The viral genome size
D) The mode of transmission

99. **What distinguishes a lytic viral infection from a lysogenic one?**

A) Lytic infections result in immediate cell death, while lysogenic infections integrate into the host genome without causing cell death initially.
B) Lysogenic infections are always chronic, while lytic infections are acute.
C) Lytic viruses can only infect eukaryotic cells, while lysogenic viruses infect prokaryotic cells.
D) There is no distinction; both types lead to cell death.

100. What might happen if a DNA virus integrates into the host genome but does not cause immediate cell death?

A) The virus will be eliminated by the host immune system.
B) It may remain dormant and potentially reactivate later, leading to disease.
C) It will rapidly replicate and cause acute symptoms.
D) The host cell will become more resistant to other viral infections.

Answers

91. A
92. D
93. C
94. B
95. B
96. C
97. B
98. A
99. A
100. B

101. **Which of the following statements is true regarding non-enveloped viruses?**

A) They are generally more resistant to environmental factors than enveloped viruses.
B) They require host cell membranes for assembly.
C) They typically enter host cells through direct fusion.
D) They are less likely to cause lytic infections.

102. **What is the function of the viral capsid?**

A) To provide energy for viral replication
B) To protect the viral genome and aid in entry into host cells
C) To synthesize viral proteins
D) To enhance the host immune response

103. **In viral pathogenesis, what is the significance of host immune responses?** A)

They have no impact on viral infections.
B) They can sometimes lead to symptoms that are more severe than the viral infection itself.
C) They completely eliminate all viral infections.
D) They only affect non-pathogenic viruses.

104. **What is a major characteristic of arboviruses?**

A) They can replicate in both humans and animals without vectors.
B) They are exclusively transmitted through respiratory droplets.
C) They require an insect vector for transmission.
D) They primarily infect plant cells.

105. **How does a positive-sense RNA virus's genome function immediately upon entering a host cell?**

A) It must be converted to DNA before any proteins can be synthesized.
B) It acts directly as mRNA, allowing for immediate translation into proteins.

C) It is packaged into the capsid before translation occurs.
D) It requires reverse transcription to be effective.

106. **Which of the following is a primary method through which enveloped viruses exit host cells?**

A) Lysis
B) Budding
C) Exocytosis
D) Both B and C

107. **What happens during the uncoating phase of viral replication?**

A) Viral proteins are synthesized.
B) The viral genome is released into the host cell.
C) New virions are assembled.
D) The host cell membrane is altered.

108. **Why are DNA viruses generally considered more oncogenic than RNA viruses?**

A) They replicate faster than RNA viruses.
B) They can directly interact with and alter host cell DNA.
C) They have more complex structures.
D) They do not have to integrate into the host genome.

109. **Which viral component is primarily responsible for the specificity of viral infection?**

A) The nucleic acid type
B) The capsid structure
C) The viral spikes or surface proteins
D) The size of the virus

110. **What role does genetic reassortment play in the evolution of viruses?**

A) It creates identical copies of the original virus.
B) It allows for the exchange of genetic material between different viral strains, leading to new variants.
C) It stabilizes the viral genome, preventing mutations.
D) It decreases the pathogenicity of the virus.

Answers

101. A
102. B
103. B
104. C
105. B

106. D
107. B
108. B
109. C
110. B

111. **What role do viral enzymes play during the replication of RNA viruses?**

A) They are not required for replication.
B) They facilitate the synthesis of viral RNA from the host's DNA.
C) They are essential for the translation of viral proteins.
D) They aid in the replication of the viral genome.

112. **Which of the following best describes the interaction between a virus and its host cell receptor?**

A) It is a random process with no specific requirements.
B) The interaction is typically non-specific, allowing any virus to infect any cell.
C) Specific interactions are necessary for successful viral entry, determined by the viral spikes and host receptors.
D) Host receptors are irrelevant to the viral infection process.

113. **What can result from the integration of viral DNA into the host genome?**

A) The host cell gains immunity against future infections.
B) The viral DNA can be expressed, leading to the production of viral proteins and possibly cancer.
C) The host cell will be permanently destroyed.
D) The integration process is reversible and does not affect the host cell.

114. **What does the term "tropism" refer to in virology?**

A) The ability of a virus to cause disease.
B) The specific host cells or tissues that a virus can infect.
C) The environmental conditions required for viral replication.
D) The replication rate of a virus within a host.

115. **Which factor can lead to an increased mutation rate in RNA viruses?**

A) Their ability to use host cell machinery for replication.
B) The lack of proofreading mechanisms during RNA replication.
C) Their dependence on host cell enzymes for transcription.
D) Their use of reverse transcriptase.

116. **What distinguishes the assembly of non-enveloped viruses from that of enveloped viruses?**

A) Non-enveloped viruses always require the nucleus for assembly.
B) Enveloped viruses must acquire a lipid envelope during assembly, while non-enveloped viruses do not.
C) Non-enveloped viruses cannot exit the host cell.
D) Both types of viruses assemble exclusively in the cytoplasm.

117. **What is one consequence of a virus lacking an envelope?**

A) It can easily fuse with host membranes for entry.
B) It is more susceptible to environmental degradation.
C) It can replicate faster than enveloped viruses.
D) It can cause chronic infections more effectively.

118. **In what way can the presence of specific enzymes in a virus affect its replication?**

A) They have no impact on replication.
B) They can enable the virus to replicate its genome independently of host cell machinery.
C) They solely assist in the assembly of new viral particles.
D) They are required for entry into the host cell.

119. **What defines the viral "life cycle" from a virology perspective?**

A) The time taken for the virus to mutate.
B) The sequence of events from viral entry to release from the host cell.
C) The ability of the virus to evade the host immune response.
D) The genetic changes that occur in the virus during replication.

120. **Which of the following is a characteristic of both lytic and lysogenic infections?**

A) Both result in immediate cell death.
B) Both involve the integration of viral DNA into the host genome.
C) Both can result in the production of new viral particles.
D) Both exclusively infect prokaryotic cells.

Answers

111. D
112. C
113. B
114. B
115. B
116. B
117. B
118. B
119. B
120. C

121. **What mechanism allows retroviruses like HIV to integrate their genetic material into the host genome?**

A) Transcription
B) Translation
C) Reverse transcription
D) Replication

122. **Which viral structure is primarily responsible for mediating attachment to host cells?**

A) Capsid
B) Envelope
C) Spikes (surface proteins)
D) Nucleic acid

123. **Why are RNA viruses more prone to rapid evolution compared to DNA viruses?**

A) They replicate more slowly.
B) They lack proof-reading mechanisms during replication.
C) They have simpler structures.
D) They require host DNA for replication.

124. **What type of virus is characterized by requiring an insect vector for transmission?**

A) Oncovirus
B) Arbovirus
C) Retrovirus
D) Bacteriophage

125. **In which cellular compartment do most RNA viruses replicate?**

A) Nucleus
B) Cytoplasm
C) Mitochondria
D) Golgi apparatus

126. **What is the significance of the "eclipse phase" in viral infections?**

A) It represents the time when the virus is actively replicating.
B) The virus is not detectable and cannot infect other cells.
C) It is when the virus assembles new particles.
D) It is the period following viral release.

127. **What can occur as a result of a bacteriophage infecting a non-pathogenic bacterium?**

A) The bacterium will always become pathogenic.
B) The bacterium may acquire new virulence factors, becoming pathogenic.
C) The bacterium will be destroyed immediately.
D) The bacterium will eliminate the virus without any changes.

128. **What is the primary mode of action for antiviral drugs targeting viral replication?**

A) They boost the host immune response.
B) They inhibit viral enzyme functions.
C) They destroy viral particles outside the host cell.
D) They enhance viral entry into host cells.

129. **How do non-enveloped viruses typically exit a host cell?**

A) Budding from the membrane
B) Lysis or cell rupture
C) Endocytosis
D) Through exocytosis

130. **What does the term "viral load" refer to in the context of an infection?**

A) The total number of viral proteins produced
B) The amount of viral genetic material present in a given volume
C) The duration of the infection
D) The level of host immune response

Answers

121. C
122. C
123. B
124. B
125. B
126. B
127. B
128. B
129. B
130. B

131. **Which of the following viral replication steps involves the release of viral genetic material into the host cell?**

A) Adsorption
B) Entry
C) Uncoating
D) Assembly

132. **What role do host cell enzymes play during the uncoating phase of viral replication?**

A) They synthesize new viral proteins.
B) They degrade the viral capsid, releasing the genome.
C) They assist in viral assembly.
D) They enhance viral entry into the host.

133. **What is the primary function of viral polymerases?**

A) To assemble viral proteins
B) To replicate viral nucleic acids
C) To facilitate viral entry into host cells
D) To interact with host immune cells

134. **Which of the following factors can influence the severity of a viral infection?**

A) Host genetic factors
B) The virulence of the virus
C) The immune status of the host
D) All of the above

135. **What characteristic distinguishes a virus from other pathogens like bacteria?**

A) Viruses can replicate independently.
B) Viruses lack cellular structures.
C) Viruses do not cause disease.
D) Viruses are larger than bacteria.

136. **How do enveloped viruses typically acquire their envelope?**

A) From the host's nuclear membrane
B) Through lysosomal membranes
C) By budding off from the host cell membrane
D) By synthesizing a new membrane

137. **In which phase of the viral life cycle do spikes or surface proteins play a critical role?**

A) Assembly
B) Entry
C) Uncoating
D) Release

138. **What is the primary reason that many RNA viruses are considered to be acute infections?**

A) They replicate slowly and cause chronic infections.
B) They typically lead to rapid disease onset and resolution.
C) They always result in persistent infections.
D) They are easily cleared by the immune system.

139. **Which type of viral infection can remain dormant for extended periods before reactivation?**

A) Acute infection
B) Lytic infection
C) Lysogenic infection
D) Chronic infection

140. **What is the importance of studying viral pathogenesis in understanding viral diseases?**

A) It helps to develop vaccines and antiviral therapies.
B) It has no practical applications.
C) It focuses solely on the structure of viruses.
D) It only addresses the host's immune response.

Answers

131. C
132. B
133. B
134. D
135. B
136. C
137. B
138. B
139. C
140. A

141. **Which of the following is a common feature of retroviruses?**

A) They have a double-stranded DNA genome.
B) They convert RNA into DNA using reverse transcriptase.
C) They replicate exclusively in the cytoplasm.
D) They always cause acute infections.

142. **In the context of viral infections, what is the "lysis" process?**

A) The integration of viral DNA into the host genome.
B) The process of viral budding from the host cell.
C) The rupture of the host cell, releasing new virions.
D) The uncoating of the viral genome.

143. **What mechanism do non-enveloped viruses typically use to enter host cells?**

A) Direct fusion with the host cell membrane
B) Endocytosis
C) Active transport
D) Passive diffusion

144. **Which type of viral infection is characterized by the virus remaining dormant in the host?**

A) Lytic infection
B) Chronic infection
C) Latent infection
D) Acute infection

145. **What is the main reason that DNA viruses often have a higher likelihood of causing cancer compared to RNA viruses?**

A) They replicate in the cytoplasm.
B) They can directly interact with and alter host DNA.
C) They do not need a host for replication.
D) They are always more virulent.

146. **Which of the following accurately describes "budding"?**

A) The immediate death of the host cell
B) A process by which enveloped viruses exit the host cell without killing it
C) The random entry of viruses into the host
D) The replication of viral DNA

147. **What is a defining characteristic of arboviruses?**

A) They can be transmitted through respiratory droplets.
B) They require an insect vector for transmission.
C) They only infect plant cells.
D) They replicate in the host's nucleus.

148. **In viral pathogenesis, what role does the host immune response play?**

A) It is ineffective against all viral infections.
B) It can lead to symptoms that are more severe than the disease itself.
C) It eliminates all viral particles immediately.
D) It only affects the severity of bacterial infections.

149. **What is the function of viral spikes in the context of viral infections?**

A) They provide energy for viral replication.
B) They are involved in the assembly of new virions.
C) They mediate attachment and entry into host cells.
D) They protect the viral genome from degradation.

150. **Which of the following statements is true about viral genetic material?**

A) All viruses contain both DNA and RNA.
B) Viral genomes can be single-stranded or double-stranded.
C) Viral DNA is always located in the cytoplasm.
D) RNA viruses cannot replicate their genomes within host cells.

Answers

141. B
142. C
143. B
144. C
145. B
146. B
147. B
148. B
149. C
150. B

151. **All of these statements about viral classification are correct except:**

A) Viruses can be classified based on host preference.
B) Historical classifications have consistent categories.
C) Current classifications utilize genomic analysis.
D) Viruses can be grouped by their biophysical structure.

152. **All of these characteristics of RNA viruses are correct except:**

A) RNA viruses can replicate in the cytoplasm.
B) They do not require host cell enzymes for replication.
C) Some RNA viruses can cause acute infections.
D) They often have higher mutation rates compared to DNA viruses.

153. **All of the following are methods of viral entry into host cells except:**

A) Direct fusion with the plasma membrane
B) Endocytosis
C) Passive diffusion
D) Random collision

154. **All of these statements about the life cycle of a virus are incorrect except:**

A) Viruses can reproduce independently of host cells.
B) The lysis of the host cell usually results in the release of new virions.

C) The viral genome remains intact during the uncoating phase.
D) Assembly of viral components can occur in the cytoplasm or nucleus.

155. **All of these factors influence viral pathogenesis except:**

A) The virulence of the virus
B) The genetic makeup of the host
C) The method of viral entry into the host
D) The season of the year

156. **All of these characteristics of retroviruses are correct except:**

A) They have an RNA genome.
B) They use reverse transcriptase to convert RNA into DNA.
C) They can directly replicate their RNA in the host's nucleus.
D) They integrate their DNA into the host genome.

157. **All of the following are true about the synthesis of viral components except:**

A) Viral proteins are synthesized using host cell ribosomes.
B) Viral polymerases can replicate nucleic acids.
C) Structural proteins are assembled during the uncoating phase.
D) Non-structural proteins include enzymes necessary for replication.

158. **All of these statements about viral infections are correct except:**

A) Most viral infections are subclinical and do not show noticeable symptoms.
B) Viral infections can trigger immune responses.
C) Some viruses can completely shut down host metabolic activities.
D) All viral infections are associated with severe disease.

Answers

151. B
152. B
153. C
154. A
155. D
156. C
157. C
158. D

159. **All of these statements about the structure of viruses are correct except:**

A) All viruses contain a protein coat called a capsid.
B) Some viruses have an outer lipid envelope.

C) Viruses can have either DNA or RNA as their genetic material.
D) All viruses have a complex multicellular structure.

160. **All of the following statements about viral replication are incorrect except:**

A) Viruses can replicate independently of host cells.
B) The host cell is essential for viral multiplication.
C) Uncoating involves the assembly of new viral particles.
D) Viruses do not need to attach to host cells to enter.

161. **All of these factors influence the transmission of arboviruses except:**

A) Insect vectors
B) Human-to-human contact
C) Environmental conditions
D) Geographic distribution of the vectors

162. **All of these characteristics of DNA viruses are true except:**

A) They must enter the host cell nucleus for replication.
B) They are generally less stable than RNA viruses.
C) Some can cause long-term infections.
D) They can integrate into the host's DNA.

163. **All of these statements about the immune response to viral infections are correct except:**

A) The immune response can help clear viral infections.
B) Some viruses can evade the immune response.
C) All viral infections lead to strong immune responses.
D) Vaccines can prepare the immune system to fight specific viruses.

164. **All of these mechanisms for viral release are correct except:**

A) Budding is a common method for enveloped viruses.
B) Non-enveloped viruses typically exit by cell lysis.
C) Viruses can be released through exocytosis without damaging the cell.
D) All viruses require active transport to leave the host cell.

165. **All of these statements about the effects of viral infections on host cells are true except:**

A) Some viruses can cause cell death through lysis.
B) Viral infections can trigger cellular apoptosis.
C) All viral infections lead to the immediate destruction of host cells.
D) Some viruses can manipulate host cell metabolism for replication.

166. **All of the following are true regarding the synthesis of viral nucleic acids except:**

A) RNA viruses can directly translate their RNA into proteins.
B) DNA viruses replicate their DNA in the host's nucleus.
C) Viral polymerases are always provided by the host cell.
D) Some RNA viruses can serve as templates for reverse transcription.

Answers

159. D
160. B
161. B
162. B
163. C
164. D
165. C
166. C

167. **All of these statements about viral entry mechanisms are incorrect except:**

A) Non-enveloped viruses enter solely by active transport.
B) Enveloped viruses can enter through endocytosis or fusion with the membrane.
C) Viruses do not require specific receptors for entry into host cells.
D) All viruses can penetrate host cells without any specific mechanism.

168. **All of these characteristics of RNA viruses are incorrect except:**

A) RNA viruses replicate only in the nucleus of the host cell.
B) They typically have lower mutation rates than DNA viruses.
C) Some RNA viruses can directly serve as mRNA for protein synthesis.
D) RNA viruses always require the host’s DNA for replication.

169. **All of these statements about the role of the immune system in viral infections are incorrect except:**

A) The immune system is ineffective against all viral infections.
B) Immune responses can sometimes cause more harm than the virus itself.
C) All viruses elicit strong immune responses.
D) Vaccines have no impact on the immune system's ability to combat viruses.

170. **All of these options regarding the consequences of viral replication in host cells are incorrect except:**

A) Viral replication always leads to the immediate death of host cells.
B) Some viruses can cause chronic infections without killing host cells.
C) All viral infections result in visible symptoms.

D) The host's metabolic processes are always completely halted by viral infection.

171. **All of these statements about viral transmission are incorrect except:**

A) Viruses can only be transmitted through direct contact.
B) Arboviruses require insect vectors for transmission.
C) Viral infections can occur without any mode of transmission.
D) All viruses are spread through respiratory droplets.

172. **All of these characteristics of bacteriophages are incorrect except:**

A) Bacteriophages are known to infect only human cells.
B) They can contain both RNA and DNA genomes.
C) Bacteriophages replicate within the human bloodstream.
D) Bacteriophages do not have any impact on bacterial pathogenicity.

Answers

167. B
168. C
169. B
170. B
171. B
172. B

173. **All of these statements about viral structure are incorrect except:**

A) All viruses possess a cellular structure similar to bacteria.
B) Some viruses have an outer lipid envelope that aids in entry.
C) Viruses do not contain any proteins in their structure.
D) All viruses contain ribosomes for protein synthesis.

174. **All of these statements regarding the life cycle of viruses are incorrect except:**

A) The viral genome is always fully intact during replication.
B) Viruses can replicate independently without host cells.
C) Assembly of new viral particles can occur in the cytoplasm or nucleus.
D) All viruses exit the host cell by direct lysis.

175. **All of these characteristics of viral infections are incorrect except:**

A) Most viral infections lead to noticeable clinical symptoms.
B) Some viruses can establish chronic infections without immediate symptoms.
C) All viral infections are fatal.

D) Viral infections can trigger immune responses that provide future immunity.

176. **All of these statements about retroviruses are incorrect except:**

A) Retroviruses use reverse transcriptase to convert DNA into RNA.
B) They can integrate their genetic material into the host genome.
C) All retroviruses cause immediate disease upon infection.
D) Retroviruses replicate solely in the nucleus.

177. **All of these statements about the replication of RNA viruses are incorrect except:**

A) RNA viruses require the host's DNA for replication.
B) Some RNA viruses can directly serve as mRNA for protein synthesis.
C) RNA viruses replicate exclusively in the nucleus.
D) All RNA viruses contain reverse transcriptase.

178. **All of these statements regarding the pathogenicity of viruses are incorrect except:**

A) Viruses can only infect specific host cell types.
B) Some viruses can enhance the pathogenicity of bacteria.
C) All viruses cause disease in the host.
D) Viruses do not interact with the host's immune system.

Answers

173. B
174. C
175. B
176. B
177. B
178. B

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