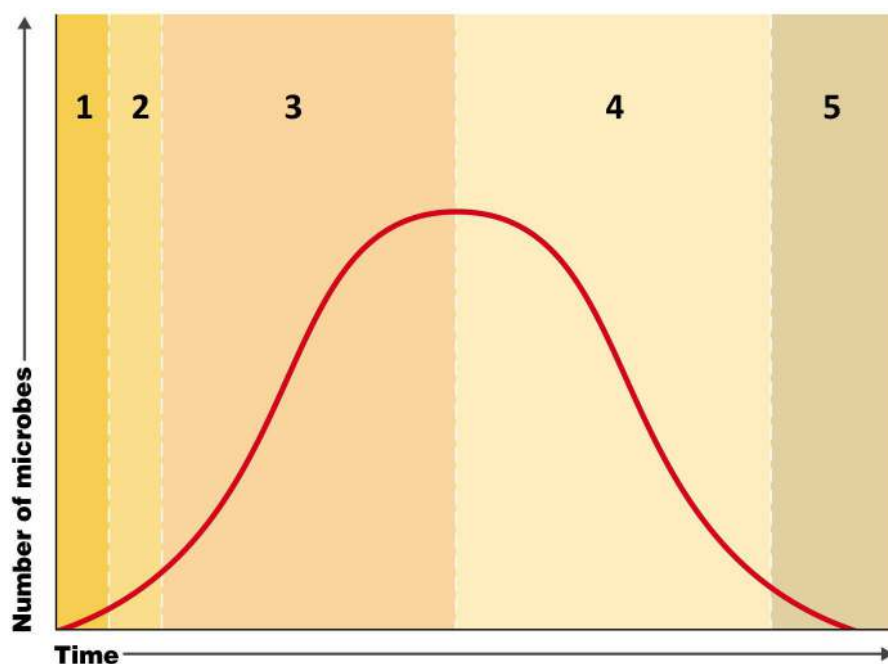

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

- The test consists of 40 multiple choice questions that must be answered on one answer sheet.
 - Your NAME and STUDENT NUMBER must appear on the answer sheet.
 - Choose the BEST answer for each question.
-

1. Which of the following chemicals does not work to kill bacteria?
 - a. Phenol
 - b. Chlorhexidine
 - c. Alcohol
 - d. Dish soap
 - e. Quaternary ammonium compounds
2. True or False: A toxin can be very harmful to humans, whereas a toxoid can help protect a human from disease.
 - a. True
 - b. False
3. Which of the following statements concerning DNA is correct?
 - a. Thymine forms base pairs with guanine.
 - b. DNA polymerase always synthesizes new DNA in the 3' → 5' direction.
 - c. Adenine forms base pairs with thymine.
 - d. The leading strand of DNA is synthesized by DNA polymerase, while the lagging strand is synthesized by primase.
 - e. None of the above statements are correct
4. DNA polymerase:
 - a. Synthesizes the leading strand in the 3' → 5' direction.
 - b. Synthesizes the lagging strand continuously.
 - c. Requires short RNA primers to begin replication.
 - d. Reads the nucleotides in the template in sets of 3.
 - e. Synthesizes Okazaki fragments in the direction that leads toward the replication fork.
5. You inject ten guinea pigs each with 50 cells of *E.coli*, and you notice that three guinea pigs develop an infection. Given this information, what are you able to determine about the ID₅₀ for *E. coli* injected into guinea pigs?
 - a. It must be less than 50
 - b. It must be more than 3
 - c. It must be exactly 50
 - d. It must be more than 50
 - e. It must be exactly 3
6. True or False: Endotoxins are toxins that can only harm a human when they are produced by bacteria that are already inside of a host cell.
 - a. True
 - b. False
7. A slow viral infection typically displays which of the following patterns?
 - a. An acute period of disease, followed by a symptomless period, then reactivation of the infectious disease at a later time.
 - b. An acute period of disease, followed by a symptomless period, with serious complications occurring years later in the absence of infectious virus particles.
 - c. An acute period of disease after which the infectious virus can be demonstrated at all times. Disease symptoms may or may not be present.
 - d. An acute period of disease followed by a gradual increase in the number of infectious viruses over a very long period of time. Symptoms of disease don't appear until after the number of viruses has increased to a significant level.

8. A pathogen that normally infects an animal host, but can occasionally be transmitted to humans is best described as:
- Oncogenic
 - Opportunistic
 - Adaptive
 - Virulent
 - Zoonotic
9. The main difference between a prion and a viroid is that:
- Prions contain genetic material, whereas viroids do not.
 - Prions are infectious, whereas viroids are not.
 - Prions cause disease in humans, whereas viroids do not.
 - Prions are made of protein, whereas viroids are not.
 - More than one of the above.

Examine the graph shown below to answer the following two questions



10. The graph shown above tracks the number of microbes present over time, during a typical illness, and shows that a typical illness can be divided into five distinct stages. During which of the numbered stages shown on the graph would you expect the patient to be most susceptible to secondary infections?
- 1
 - 2
 - 3
 - 4
 - 5
11. During which stage shown on the graph above would it be possible for the patient to transmit the disease causing pathogen onto other people?
- Stages 1, 2 and 3
 - Stages 2, 3 and 4
 - Stages 1, 2, 3 and 4
 - Stages 2, 3, 4 and 5
 - Stages 1, 2, 3, 4 and 5
12. True or False: swallowing saliva helps protect you from disease by moving the bacteria from your mouth into your stomach.
- True
 - False

13. This microorganism is a normal inhabitant of a healthy human intestine, but can act as an opportunistic pathogen when it gets into the genitourinary tract.
- Escherichia coli*
 - Streptococcus pyogenes*
 - Salmonella typhi*
 - Clostridium tetani*
 - HIV
14. You were busy studying for your MBIO1220 mid-term and you forgot to refrigerate your rice from dinner, which happened to be contaminated with *Bacillus cereus* endospores. When you consume the rice you go on to develop abdominal cramping and watery diarrhea. The abdominal cramping is an example of a(n):
- Sign
 - Symptom
 - Syndrom
 - Etiology
 - Pathogenicity
15. One day Jack forgot to wash his hands after using the washroom. As he left the washroom his hand, which was contaminated with feces, accidentally deposited fecal bacteria on the door handle. Later in the day Sam touched the door handle and picked up the fecal bacteria. Sam then picked his nose, allowing the bacteria access to his respiratory tract. Now Sam has a sinus infection! What was the route of transmission in this example?
- Direct contact transmission
 - Indirect contact transmission
 - Droplet transmission
 - Vehicle transmission
 - Vector transmission
16. Cytoskeleton rearrangement is promoted by which of the following pathogenicity factors?
- Hemolysin
 - Cytotoxin
 - Coagulase
 - Invasins
 - Fibrinolysin
17. In which of the following ways are viruses similar to bacteria?
- Viruses and bacteria both produce very few of their own enzymes, generally relying on the enzymes of a host cell to carry out their metabolic processes.
 - All viruses and all bacteria are obligate intracellular pathogens that can only multiply on the inside of a host cell.
 - Viruses and bacteria can both store their genetic material in the form of RNA.
 - Both viruses and bacteria have prokaryotic cell type.
 - None of the above.
18. Which of the following is not a characteristic of the normal microbiota?
- They provide nutrients for opportunistic pathogens.
 - They produce antimicrobials that kill invading microorganisms.
 - They produce vitamins that can be used by the host.
 - If the normal microbiota is harmed, opportunistic pathogens are more likely to cause disease.
 - None of the above, all of the options are true of the normal microbiota.
19. Which of the following viral macromolecules is correctly matched with its location of synthesis:
- DNA: cytoplasm
 - Capsomeres: nucleus
 - RNA: nucleus
 - Spikes: cytoplasm

- 20. Which of the following types of nucleic acid is not produced by transcription?**
- mRNA
 - tRNA
 - rRNA
 - DNA
 - None of the above. All kinds of nucleic acid can be produced by transcription!
- 21. True or False: A point mutation is more likely to result in a non-functional protein than a frameshift mutation.**
- True
 - False
- 22. Mosquito control is an important way of controlling the spread of infectious disease. Which mode of transmission would be most effectively controlled by lowering the mosquito population?**
- Direct contact transmission
 - Vector transmission
 - Droplet transmission
 - Vehicle transmission
 - Indirect contact transmission
- 23. A neurotoxin is particularly important in the pathogenesis of disease caused by which organism?**
- Clostridium tetani*
 - Epstein Barr virus
 - Salmonella enterica*
 - Corynebacterium diphtheriae*
 - Escherichia coli*
- 24. A nosocomial infection is best described as a disease that:**
- Affects the mucous membranes in the nasal passages.
 - Is caused by an infectious protein particle.
 - Is transferred to humans through contact with an animal.
 - Is caused by bacteria that carry vir plasmids.
 - Is acquired in a hospital.
- 25. True or False: Hexachlorophene is a potent antimicrobial chemical that is often used in eye drops to prevent gonorrheal ophthalmia, a serious eye infection in newborn babies.**
- True
 - False
- 26. Which of the following options does not correctly match the name of a group of viruses with the type of group?**
- Influenza – genus
 - Lentivirus – genus
 - Herpesviridae – family
 - Retroviridae – family
 - None of the above. (All of the options give the correct type of group for the group name given)

27. If the DNA sequence shown below was transcribed by RNA polymerase, the resulting RNA molecule would have the sequence:

3' T-A-C-T-T-A-T-G-A-A-C-T 5'

- a. 3' A-U-G-A-A-U-A-C-U-U-G-A 5'
- b. 5' A-T-G-A-A-T-A-C-T-T-G-A 3'
- c. 5' A-U-G-A-A-U-A-C-U-U-G-A 3'
- d. 3' A-G-U-U-C-A-U-A-A-G-U-A 5'

28. Which of the following infectious agents would be most resistant to disinfectants and other anti-microbial compounds?

- a. Enveloped viruses
- b. Gram positive bacteria
- c. Gram negative bacteria
- d. Prions
- e. Fungi

29. Which of the following is the most likely sequence of events in the reproductive cycle of an enveloped virus?

- a. Adsorption, endocytosis, uncoating, biosynthesis, maturation and assembly, lysis
- b. Adsorption, fusion, uncoating, biosynthesis, maturation and assembly, lysis
- c. Penetration, adsorption, uncoating and biosynthesis, maturation and assembly, lysis
- d. Adsorption, fusion, uncoating, biosynthesis, maturation and assembly, budding
- e. Adsorption, endocytosis, uncoating, biosynthesis, maturation and assembly, budding

30. True or False: Viruses can store their genetic information in either kind of nucleic acid (DNA or RNA), but the nucleic acid is always circular and double-stranded.

- a. True
- b. False

31. The term 'transduction' refers to:

- a. Vertical gene transfer.
- b. Transfer of plasmids from one bacterium to another through a pilus.
- c. Transfer of bacterial DNA by a bacteriophage from an infected cell to a recipient cell where it undergoes recombination with recipient cell DNA.
- d. Uptake of naked DNA into the bacterial cell from the extracellular environment.
- e. The production of protein from an RNA template.

32. True or False: Most healthy humans carry a number of viruses.

- a. True
- b. False

33. A naked virus:

- a. Has nucleic acid surrounded by an envelope, but does NOT have a protein coat.
- b. Has only nucleic acid that is NOT surrounded by a protein coat OR an envelope.
- c. Has a protein coat surrounded by an envelope, but does NOT have any nucleic acid.
- d. Has nucleic acid and a protein coat, but is NOT surrounded by an envelope.
- e. Has nucleic acid and a protein coat surrounded by an envelope, but does NOT have a jacket.

34. True or False: Silver compounds have antimicrobial properties and have been used in eye drops to prevent serious eye infections in newborn babies.

- a. True
- b. False

35. In comparison to the genome of a bacterium, the genome of a virus is normally:

- a. A lot smaller
- b. A lot bigger
- c. About the same size
- d. You can't really compare the size of a bacterial genome to the size of a viral genome, because the bacterial genome is made of RNA and the viral genome is made of DNA.

36. The term competitive exclusion describes the process by which:

- a. Viruses damage host cells.
- b. Opportunistic pathogens cause infection in the healthy host.
- c. Members of the normal microbiota inhibit the growth of pathogenic organisms by competing for available space and nutrients.
- d. Members of the normal microbiota produce anti-microbial substances that function to inhibit the growth of pathogenic organisms.
- e. None of the above.

37. Billy has a terrible viral infection of his respiratory tract. During which stage of infection is Billy not able to transmit the virus to his classmates:

- a. The Prodromal period
- b. The Period of convalescence
- c. The Period of infection
- d. The Incubation period
- e. None of the above, Billy is able to transmit the virus during all of the above stages of infection.

38. In which of the following ways do viruses differ from bacteria?

- a. Viruses have very few of their own enzymes, whereas bacteria produce all the enzymes they require for growth and reproduction.
- b. All viruses are obligate intracellular parasites, whereas many bacteria do not require a host for reproduction.
- c. Bacteria contain both DNA and RNA, whereas viruses contain either DNA or RNA, but not both.
- d. Bacteria have prokaryotic cell type, whereas viruses are not composed of cells.
- e. All of the above.

39. True or False: A bacterial infection is shown to be communicable therefore it must be contagious

- a. True
- b. False

40. Which of the following is not an example of a fomite:

- a. A used Kleenex
- b. A cutting board
- c. A mosquito
- d. A used syringe
- e. None of the above, all of the examples given can be fomites.

*****THE END*****