|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | | | Which disease is correctly paired with the cause of the disease? | | |
|  | | | |  |  | | --- | --- | | **A.** | athlete’s foot - fungi | | | |
|  | | | |  |  | | --- | --- | | **B.** | malaria - viruses | | | |
|  | | | |  |  | | --- | --- | | **C.** | influenza - bacteria | | | |
|  | | | |  |  | | --- | --- | | **D.** | pneumonia - protists | | | |
| 2. | | | Which **best** contrasts a bacterium and a virus? | | |
|  | | | |  |  | | --- | --- | | **A.** | A bacterium can reproduce, whereas a virus will not reproduce. | | | |
|  | | | |  |  | | --- | --- | | **B.** | A bacterium does not live in living things, whereas a virus does. | | | |
|  | | | |  |  | | --- | --- | | **C.** | A bacterium is a one-celled living organism, whereas a virus is a nonliving organism. | | | |
| 3. | | | A tapeworm lives in the intestines of its host. Which example ***best*** describes the relationship between the tapeworm and its host? | | |
|  | | | |  |  | | --- | --- | | **A.** | The tapeworm benefits from its host; however, the host is not affected. | | | |
|  | | | |  |  | | --- | --- | | **B.** | The tapeworm does not benefit from its host, but the host does benefit. | | | |
|  | | | |  |  | | --- | --- | | **C.** | The tapeworm benefits from its host, and the host is negatively affected. | | | |
| 4. | | | How does biotechnology ***most*** benefit the economy of North Carolina? | | |
|  | | | |  |  | | --- | --- | | **A.** | creation of jobs | | | |
|  | | | |  |  | | --- | --- | | **B.** | creation of hybrid plants | | | |
|  | | | |  |  | | --- | --- | | **C.** | creation of new medicines | | | |
|  | | | |  |  | | --- | --- | | **D.** | creation of transgenic species | | | |
| 5. | | | Which is a benefit of genetically modified foods? | | |
|  | | | |  |  | | --- | --- | | **A.** | The cost of research is included in the cost to the consumer. | | | |
|  | | | |  |  | | --- | --- | | **B.** | The cost of food will decrease, and the quality of food will increase. | | | |
|  | | | |  |  | | --- | --- | | **C.** | When foods are genetically modified, they no longer need to be studied. | | | |
|  | | | |  |  | | --- | --- | | **D.** | When foods are genetically modified, they are completely resistant to disease and drought. | | | |
| 6. | | | Which **best** describes a controversial issue associated with the use of genetically modified crops? | | |
|  | | | |  |  | | --- | --- | | **A.** | the use of genetically modified crops to increase potential yield | | | |
|  | | | |  |  | | --- | --- | | **B.** | the short-term use of genetically modified crops in famine-stricken countries | | | |
|  | | | |  |  | | --- | --- | | **C.** | the development of genetically modified crops which are resistant to herbicides | | | |
|  | | | |  |  | | --- | --- | | **D.** | the long-term effects which may arise from the use of genetically modified crops | | | |
| 7. | | | North Carolina has over 400 biotechnology companies. How would the economy ***most likely*** change if that number were reduced by half? | | |
|  | | | |  |  | | --- | --- | | **A.** | The economy would decline because of job loss. | | | |
|  | | | |  |  | | --- | --- | | **B.** | The economy would suffer as funding for research decreases. | | | |
|  | | | |  |  | | --- | --- | | **C.** | The economy would increase due to an increase in production. | | | |
|  | | | |  |  | | --- | --- | | **D.** | The economy would improve when the government offers assistance. | | | |
| 8. | | | A doctor prescribed an antibiotic to treat an illness. Which type of illness did the doctor ***most likely*** treat? | | |
|  | | | |  |  | | --- | --- | | **A.** | cancer | | | |
|  | | | |  |  | | --- | --- | | **B.** | heart disease | | | |
|  | | | |  |  | | --- | --- | | **C.** | viral infection | | | |
|  | | | |  |  | | --- | --- | | **D.** | bacterial infection | | | |
| 9. | | | Which application of biotechnology is of greatest economic benefit to North Carolina? | | |
|  | | | |  |  | | --- | --- | | **A.** | development of livestock that are more domesticated | | | |
|  | | | |  |  | | --- | --- | | **B.** | development of livestock that produce higher quality meat | | | |
|  | | | |  |  | | --- | --- | | **C.** | development of crops that can be grown in extremely dry environments | | | |
|  | | | |  |  | | --- | --- | | **D.** | development of crops that can be grown in extremely low temperature | | | |
| 10. | | | Why is the prevention of epidemics usually easier than the prevention of a pandemic? | | |
|  | | | |  |  | | --- | --- | | **A.** | The diseases in an epidemic are less severe than in a pandemic. | | | |
|  | | | |  |  | | --- | --- | | **B.** | Diseases causing pandemics are more contagious than diseases in an epidemic. | | | |
|  | | | |  |  | | --- | --- | | **C.** | Affected individuals in epidemics are usually more concentrated in one area than in pandemics. | | | |
| 11**.** | | | DNA analysis performed by a forensic scientist on blood found at a crime scene is compared to the DNA analysis of four suspects as shownbelow Which suspect was **most likely** present at the crime scene? | | |
| |  |  | | --- | --- | | **A.** | Suspect A | | | | |
| |  |  | | --- | --- | | **B.** | Suspect B | | | | |
| |  |  | | --- | --- | | **C.** | Suspect C | | | | |
| |  |  | | --- | --- | | **D.** | Suspect D | | | | |
| 12. | | Juan’s doctor diagnoses him with a virus, then writes a prescription for a medication. What type of medication did the doctor probably give Juan? | | | |
|  | | |  |  | | --- | --- | | **A.** | anti-viral | | | | |
|  | | |  |  | | --- | --- | | **B.** | antibiotic | | | | |
|  | | |  |  | | --- | --- | | **C.** | anti-bacterial | | | | |
| 13. | | Which ***best*** compares an epidemic and a pandemic? | | | |
|  | | |  |  | | --- | --- | | **A.** | An epidemic is caused by bacteria, while a pandemic is caused by viruses. | | | | |
|  | | |  |  | | --- | --- | | **B.** | A pandemic is spread by humans, while an epidemic is spread by insects and rodents. | | | | |
|  | | |  |  | | --- | --- | | **C.** | A pandemic occurs in a small region, while an epidemic occurs in a much larger region. | | | | |
|  | | |  |  | | --- | --- | | **D.** | An epidemic affects a small population of humans, while a pandemic affects a large population of humans. | | | | |
| 14. | | Which condition must be fulfilled in order for a virus to reproduce? | | | |
|  | | |  |  | | --- | --- | | **A.** | A virus must have completed internal replication of its DNA. | | | | |
|  | | |  |  | | --- | --- | | **B.** | A virus must be absorbed by a living cell. | | | | |
|  | | |  |  | | --- | --- | | **C.** | A virus must store a surplus of tRNA and amino acids. | | | | |
|  | | |  |  | | --- | --- | | **D.** | A virus must have taken over the protein production resources of a cell. | | | | |
| 15. | | Which is the easiest way for a person to prevent microbial infections? | | | |
|  | | |  |  | | --- | --- | | **A.** | Avoid contact with animals. | | | | |
|  | | |  |  | | --- | --- | | **B.** | Isolate themselves at home. | | | | |
|  | | |  |  | | --- | --- | | **C.** | Sterilize everything in the home. | | | | |
|  | | |  |  | | --- | --- | | **D.** | Wash hands frequently with hot water and soap. | | | | |
| 16. | | Diseases that can be transmitted between organisms are | | | |
|  | | |  |  | | --- | --- | | **A.** | infectious. | | | | |
|  | | |  |  | | --- | --- | | **B.** | inherited. | | | | |
|  | | |  |  | | --- | --- | | **C.** | environmental. | | | | |
|  | | |  |  | | --- | --- | | **D.** | congenital. | | | | |
| 17. | | Which are ***most closely*** related to biotechnology? | | | |
|  | | |  |  | | --- | --- | | **A.** | medicine and agriculture | | | | |
|  | | |  |  | | --- | --- | | **B.** | construction and engineering | | | | |
|  | | |  |  | | --- | --- | | **C.** | water treatment and electricity generation | | | | |
|  | | |  |  | | --- | --- | | **D.** | communication and information technology | | | | |
| 18. | | Which is the ***most useful*** change made to crops using applications of biotechnology? | | | |
|  | | |  |  | | --- | --- | | **A.** | Crops use more nutrients. | | | | |
|  | | |  |  | | --- | --- | | **B.** | Crops need more fertilizer. | | | | |
|  | | |  |  | | --- | --- | | **C.** | Crops resist more diseases. | | | | |
|  | | |  |  | | --- | --- | | **D.** | Crops take more time to grow. | | | | |
| 19. | | Which action would ***most quickly*** reduce the spread of an infectious disease? | | | |
|  | | |  |  | | --- | --- | | **A.** | isolating all carriers | | | | |
|  | | |  |  | | --- | --- | | **B.** | improving sanitary conditions | | | | |
|  | | |  |  | | --- | --- | | **C.** | restricting population growth of the vector | | | | |
|  | | |  |  | | --- | --- | | **D.** | increasing the population density of humans in the area | | | | |
| 20. | | Which person would benefit ***most*** from biotechnology? | | | |
|  | | |  |  | | --- | --- | | **A.** | a cook | | | | |
|  | | |  |  | | --- | --- | | **B.** | a farmer | | | | |
|  | | |  |  | | --- | --- | | **C.** | an architect | | | | |
|  | | |  |  | | --- | --- | | **D.** | an automobile engineer | | | | |
| 21. | | Which area of biotechnology would **most likely** create ethical issues within human society? | | | |
|  | | |  |  | | --- | --- | | **A.** | insulin production by bacteria | | | | |
|  | | |  |  | | --- | --- | | **B.** | organ cloning for use in transplants | | | | |
|  | | |  |  | | --- | --- | | **C.** | genetic engineering to improve agricultural yields | | | | |
|  | | |  |  | | --- | --- | | **D.** | DNA and forensic testing of crime scene evidence | | | | |
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|  | |  | | | |
| 22. | | Which characteristic makes it easy to spread, but difficult to treat and prevent certain fungal infections? | | | |
|  | | |  |  | | --- | --- | | **A.** | Fungi are multicellular. | | | | |
|  | | |  |  | | --- | --- | | **B.** | Fungi are heterotrophic. | | | | |
|  | | |  |  | | --- | --- | | **C.** | Fungi reproduce by spores. | | | | |
|  | | |  |  | | --- | --- | | **D.** | Fungi grow in dry environments. | | | | |
| 23. Which aspect of modern life could most likely cause an epidemic to turn into a  pandemic? | | | | |
| |  |  | | --- | --- | | **A.** | vaccination | | | | | |
| |  |  | | --- | --- | | **B.** | transportation | | | | | |
| |  |  | | --- | --- | | **C.** | communication | | | | | |
| |  |  | | --- | --- | | **D.** | sanitation | | | | | |
| 24. | After World War I, an outbreak of the Spanish Flu killed 50 million to 100 million people around the world. Which **best** describes this occurrence? | | | | |
|  | |  |  | | --- | --- | | **A.** | Epidemic, because it happened within a relatively short time span. | | | | | |
|  | |  |  | | --- | --- | | **B.** | Epidemic, because it affected many individuals in multiple countries. | | | | | |
|  | |  |  | | --- | --- | | **C.** | Pandemic, because it happened within a relatively short time span. | | | | | |
|  | |  |  | | --- | --- | | **D.** | Pandemic, because it affected many individuals in multiple countries. | | | | | |
| 25. | How are quarantines used to slow the spread of an epidemic? | | | | |
|  | |  |  | | --- | --- | | **A.** | Quarantines prevent individuals from eating food that is potentially contaminated. | | | | | |
|  | |  |  | | --- | --- | | **B.** | Quarantines allow enough time for antibiotics to take effect in infected individuals. | | | | | |
|  | |  |  | | --- | --- | | **C.** | Quarantines keep infected individuals separate so they cannot pass the disease to others. | | | | | |
|  | |  |  | | --- | --- | | **D.** | Quarantines keep people inside their homes so that family members can provide care for each other. | | | | | |
| 26. | Which organisms require a host cell to reproduce? | | | | |
|  | |  |  | | --- | --- | | **A.** | protozoan | | | | | |
|  | |  |  | | --- | --- | | **B.** | bacteria | | | | | |
|  | |  |  | | --- | --- | | **C.** | viruses | | | | | |
| 27. | Which contagion is correctly matched to the disease it causes? | | | | |
|  | |  |  | | --- | --- | | **A.** | polio - virus | | | | | |
|  | |  |  | | --- | --- | | **B.** | rabies - fungus | | | | | |
|  | |  |  | | --- | --- | | **C.** | influenza - parasite | | | | | |
|  | |  |  | | --- | --- | | **D.** | chicken pox - bacteria | | | | | |

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| --- | --- |
| 28. | Millions of people living all over the world have cancer. Is cancer a  pandemic? |
|  | |  |  | | --- | --- | | **A.** | No, because cancer is not contagious. | |
|  | |  |  | | --- | --- | | **B.** | No, because cancer is not always fatal. | |
|  | |  |  | | --- | --- | | **C.** | Yes, because millions of people have cancer. | |
|  | |  |  | | --- | --- | | **D.** | Yes, because people all over the world have cancer. | |
| 29. | Which career field is ***most closely*** related to biotechnology? |
|  | |  |  | | --- | --- | | **A.** | medicine | |
|  | |  |  | | --- | --- | | **B.** | journalism | |
|  | |  |  | | --- | --- | | **C.** | meteorology | |
|  | |  |  | | --- | --- | | **D.** | political science | |
| 30. | Which situation would ***most*** favor the spread of infectious disease? |
|  | |  |  | | --- | --- | | **A.** | overcrowding | |
|  | |  |  | | --- | --- | | **B.** | use of vaccines | |
|  | |  |  | | --- | --- | | **C.** | small population | |
|  | |  |  | | --- | --- | | **D.** | sanitary conditions | |
| 31. | Many countries in the world eat a diet consisting mostly of rice which is filling but is often low in nutritional value. Which one of these biotechnologies could be used to create a more nutritional rice? |
|  | |  |  | | --- | --- | | **A.** | genetic modification of current rice plants | |
|  | |  |  | | --- | --- | | **B.** | selective breeding of current rice plants | |
|  | |  |  | | --- | --- | | **C.** | cloning of current rice plants | |

|  |  |
| --- | --- |
| 32**.** | Bacteria cells can be used to produce insulin for the treatment of diabetes in humans. Which **best** explains how the bacteria cells are able to produce insulin for humans? |
|  | |  |  | | --- | --- | | **A.** | The bacteria have been grown on a petri dish containing insulin. | |
|  | |  |  | | --- | --- | | **B.** | The bacteria have been genetically engineered to contain the DNA needed to produce insulin. | |
|  | |  |  | | --- | --- | | **C.** | The bacteria have been exposed to radioactivity to create mutant strains capable of producing insulin. | |
|  | |  |  | | --- | --- | | **D.** | The bacteria have been grown on a petri dish containing sugar; the bacteria produce insulin in response to the sugar. | |
| 33. | Which is a benefit of storing the genetic information of people who have previously committed a serious crime? |
|  | |  |  | | --- | --- | | **A.** | Offenders will be easier for potential victims to identify since their genetic information is on file. | |
|  | |  |  | | --- | --- | | **B.** | Offenders can be genetically profiled to determine which type of crime they will commit in the future. | |
|  | |  |  | | --- | --- | | **C.** | Offenders can be more easily identified by their genetic information if they commit a crime in the future. | |
|  | |  |  | | --- | --- | | **D.** | Offenders can have their genetic information altered so that they are less likely to commit crimes in the future. | |
| 34. | A mosquito can spread the West Nile Virus but remains unaffected by the disease. Which **best** describes the mosquito? |
|  | |  |  | | --- | --- | | **A.** | vector | |
|  | |  |  | | --- | --- | | **B.** | parasite | |
|  | |  |  | | --- | --- | | **C.** | mutagen | |
|  | |  |  | | --- | --- | | **D.** | pathogen | |