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Practice questions on Unit 4 – Micro-organisms and disease

1. What is the term for the widely accepted idea that micro-organisms cause disease?
 - a) Germ theory
 - b) Spontaneous generation theory
 - c) Immune system theory
 - d) Pathogenic theory

2. What is the term for unique protein molecules carried by pathogens that stimulate an immune response?
 - a) Pathogens
 - b) Antibodies
 - c) Antigens
 - d) Phagocytes

3. What is the term for the cells that engulf and digest disabled pathogens?
 - a) White blood cells
 - b) Lymphocytes
 - c) Antigens
 - d) Phagocytes

4. What is the term for the immunity developed after encountering a disease-causing pathogen?
 - a) Innate immunity
 - b) Acquired immunity
 - c) Passive immunity
 - d) Natural immunity

5. What is the term for the process by which micro-organisms arise from non-living matter spontaneously?
 - a) Germ theory
 - b) Immune system theory

- c) Spontaneous generation theory
 - d) Pathogenic theory
6. Who is credited with designing the first microscope?
- a) Anton van Leeuwenhoek
 - b) Louis Pasteur
 - c) Robert Koch
 - d) Alexander Fleming
7. What improvement did Robert Koch make to microscopes in the 19th century?
- a) He designed the first microscope.
 - b) He discovered antibiotics.
 - c) He improved microscopes to visualize bacteria clearly.
 - d) He developed vaccines for various diseases.
8. What did Louis Pasteur's experiments disprove?
- a) The existence of bacteria
 - b) The theory of spontaneous generation
 - c) The effectiveness of vaccines
 - d) The role of white blood cells in immunity
9. How did Louis Pasteur contribute to the field of microbiology?
- a) By inventing the first vaccine
 - b) By discovering antibiotics
 - c) By identifying micro-organisms causing diseases and developing vaccines
 - d) By disproving the germ theory
10. What is the primary function of white blood cells in the immune system?
- a) To carry oxygen
 - b) To produce antigens

- c) To engulf and destroy pathogens
 - d) To carry nutrients to cells
11. What specific diseases did Louis Pasteur identify the micro-organisms for?
- a) Influenza and smallpox
 - b) Anthrax, rabies, and diphtheria
 - c) Tuberculosis and malaria
 - d) Polio and typhoid
12. How does acquired immunity differ from innate immunity?
- a) Acquired immunity is present from birth, while innate immunity is developed after exposure to pathogens.
 - b) Acquired immunity is temporary, while innate immunity is permanent.
 - c) Acquired immunity is specific to particular pathogens, while innate immunity provides general protection.
 - d) Acquired immunity relies solely on vaccines, while innate immunity relies on natural defenses.
13. What role do antigens play in the immune response?
- a) They destroy pathogens directly.
 - b) They stimulate the production of antibodies.
 - c) They engulf and digest pathogens.
 - d) They regulate the body's temperature during infection.
14. Why is acquired immunity sometimes ineffective against certain pathogens like the HIV/AIDS virus?
- a) Because the body cannot produce antibodies against those pathogens.
 - b) Because the pathogens mutate rapidly, evading the immune response.
 - c) Because the immune system becomes overwhelmed by the sheer number of pathogens.
 - d) Because the pathogens do not carry antigens on their surfaces.
15. How do artificial defense mechanisms aid in fighting against microorganisms?

- a) By directly killing pathogens
- b) By enhancing the body's natural immune response
- c) By preventing pathogens from entering the body
- d) By replacing the function of white blood cells

16. What is sterilisation?

- a) Reducing the number of micro-organisms on a surface
- b) Killing all micro-organisms in a material or on an object
- c) Purifying water from harmful chemicals
- d) Preventing the growth of micro-organisms in food

17. What does autoclaving involve?

- a) Treating food with intense heat to kill micro-organisms
- b) Sterilisation of items in intense heat under pressure
- c) Applying antiseptics to living tissue to prevent infection
- d) Using chemicals to kill micro-organisms on surfaces

18. What characterizes pasteurisation?

- a) Heating food to kill all micro-organisms present
- b) Heating food to reduce the number of living micro-organisms
- c) Exposing food to ultraviolet light to kill pathogens
- d) Cooling food rapidly to prevent the growth of bacteria

19. What are disinfectants used for?

- a) To reduce the number of living micro-organisms on a surface
- b) To stimulate the immune system to produce antibodies
- c) To preserve food by removing moisture from it
- d) To kill micro-organisms in food without altering its taste

20. What are antiseptics?

Unit 4 – Micro-organisms and disease

- a) Chemicals applied to inanimate objects to kill micro-organisms
 - b) Solutions used to preserve food by reducing its pH
 - c) Chemicals applied to living tissue to kill micro-organisms
 - d) Substances used to neutralize the effects of allergens
21. How does vaccination contribute to disease prevention?
- a) By directly killing pathogens in the body
 - b) By triggering the immune system to produce antibodies against specific pathogens
 - c) By removing toxins produced by bacteria
 - d) By blocking the entry of viruses into cells
22. How do antibiotics differ from antiseptics and disinfectants?
- a) Antibiotics specifically target fungi and viruses
 - b) Antibiotics specifically target bacteria and do not harm human cells
 - c) Antiseptics and disinfectants are only effective externally
 - d) Antiseptics and disinfectants are only used in medical settings
23. What distinguishes live vaccines from dead vaccines?
- a) Live vaccines contain no micro-organisms
 - b) Live vaccines contain weakened micro-organisms
 - c) Dead vaccines contain weakened micro-organisms
 - d) Dead vaccines contain no micro-organisms
24. What is the primary purpose of using UHT treatment on food?
- a) To reduce the temperature of food rapidly
 - b) To prevent the growth of mold on food surfaces
 - c) To kill all micro-organisms present
 - d) To increase the nutritional value of food
25. What characterizes the microbiology field?

- a) Study of macro-organisms
 - b) Study of micro-organisms
 - c) Study of weather patterns
 - d) Study of human behavior
26. Why are vaccines not effective against diseases caused by viruses?
- a) Viruses mutate rapidly, making vaccines ineffective
 - b) Vaccines do not trigger an immune response against viruses
 - c) Viruses can evade the immune system's response to vaccines
 - d) Vaccines cannot penetrate the viral membrane to trigger immunity
27. What is the significance of Louis Pasteur's work in microbiology?
- a) He developed the first antibiotic
 - b) He identified the microbial causes of several diseases
 - c) He discovered the first live vaccine
 - d) He invented the autoclave for sterilisation
28. How do antiseptics differ from disinfectants?
- a) Antiseptics are used on living tissue, while disinfectants are used on inanimate objects
 - b) Antiseptics are more potent than disinfectants
 - c) Antiseptics are only used in medical settings, while disinfectants are used in households
 - d) Antiseptics are effective against viruses, while disinfectants are not
29. What is the mechanism of action of antibiotics?
- a) They trigger the immune system to produce antibodies
 - b) They directly kill bacteria without harming human cells
 - c) They prevent bacteria from attaching to host cells
 - d) They inhibit the growth of viruses by interfering with their replication
30. Why are live vaccines preferred over dead vaccines in some cases?

- a) Live vaccines provide longer-lasting immunity
- b) Live vaccines have a higher safety profile
- c) Live vaccines do not require refrigeration for storage
- d) Live vaccines are more effective against antibiotic-resistant bacteria

To help students understand the concepts of various diseases and their treatments, We'll provide multiple-choice questions covering the causative agents, causes, and treating mechanisms of each disease mentioned in the content.

31. What is the primary mode of transmission for tapeworm infections?

- a) Mosquito bites
- b) Contaminated water
- c) Ingestion of under-cooked meat
- d) Inhalation of airborne particles

32. Which of the following parasites causes malaria?

- a) Tapeworm
- b) Plasmodium
- c) Bacteria
- d) Virus

32. How is tuberculosis typically transmitted?

- a) Through sexual contact
- b) By consuming contaminated food
- c) By inhaling airborne bacteria
- d) Through contaminated blood transfusions

34. What is the most effective method for treating AWD?

- a) Antibiotic therapy
- b) Surgical intervention
- c) Rehydration with electrolyte-containing fluids
- d) Bed rest and isolation

35. How is cholera primarily spread?
- a) Through mosquito bites
 - b) By consuming contaminated food or water
 - c) Through sexual contact
 - d) By inhaling airborne particles
36. What is the primary source of typhoid fever transmission?
- a) Contaminated water or food
 - b) Inhalation of airborne bacteria
 - c) Sexual contact
 - d) Mosquito bites
37. How is gonorrhoea typically transmitted?
- a) By consuming contaminated food
 - b) Through inhalation of airborne particles
 - c) By mosquito bites
 - d) Through sexual contact
38. Which of the following is a symptom of syphilis?
- a) Vaginal discharge
 - b) Yellowish-white discharge from the penis
 - c) Painful ulcers in the genital area
 - d) Night sweats and fatigue
39. What is a characteristic symptom of chancroid?
- a) Persistent cough
 - b) Painful ulcers in the genital area
 - c) Yellowish-white discharge from the penis
 - d) Fever and chills

40. What is the recommended first-line antibiotic treatment for typhoid fever?

- a) Ciprofloxacin
- b) Penicillin
- c) Azithromycin
- d) Doxycycline

Answer key

1. Germ theory (a): This theory proposes that micro-organisms, like bacteria and viruses, are the primary cause of many diseases, rather than supernatural or spontaneous causes.
2. Antigens (c): Antigens are specific molecules, often proteins, on the surface of pathogens that trigger an immune response, leading to the production of antibodies.
3. Phagocytes (d): Phagocytes are specialized white blood cells that engulf and digest foreign particles, including pathogens, contributing to the body's immune response.
4. Acquired immunity (b): Acquired immunity is immunity that develops after exposure to a disease-causing agent, leading to the production of specific antibodies against that agent.
5. Spontaneous generation theory (c): This theory posited that living organisms could arise spontaneously from non-living matter, a notion eventually disproven by experiments, particularly those conducted by Louis Pasteur.
6. Anton van Leeuwenhoek (a): Leeuwenhoek is credited with designing and building some of the earliest microscopes, which he used to observe microorganisms for the first time.
7. He improved microscopes to visualize bacteria clearly (c): Robert Koch's contributions primarily focused on improving microscopes, enabling clearer visualization of bacteria, which was instrumental in advancing the field of microbiology.
8. The theory of spontaneous generation (b): Louis Pasteur's experiments helped disprove the theory of spontaneous generation, demonstrating that microorganisms do not arise spontaneously from non-living matter.
9. Identifying micro-organisms causing diseases and developing vaccines (c): Pasteur's significant contributions include identifying the microbial causes of diseases like anthrax and rabies and developing vaccines against them.
10. To engulf and destroy pathogens (c): White blood cells, particularly phagocytes, play a crucial role in the immune system by engulfing and destroying pathogens.
11. Anthrax, rabies, and diphtheria (b): Louis Pasteur identified the micro-organisms responsible for anthrax, rabies, and diphtheria, among other diseases.
12. Acquired immunity is specific to particular pathogens, while innate immunity provides general protection (c): Acquired immunity develops after exposure to

specific pathogens and involves the production of antibodies targeted against those pathogens, whereas innate immunity provides general protection against a wide range of threats.

13. They stimulate the production of antibodies (b): Antigens play a crucial role in the immune response by triggering the production of antibodies specific to the invading pathogens.
14. Because the pathogens mutate rapidly, evading the immune response (b): Certain pathogens like the HIV/AIDS virus mutate rapidly, making it difficult for the immune system to generate an effective response against them.
15. b) By enhancing the body's natural immune response): Artificial defense mechanisms, such as vaccines and antibiotics, bolster the body's natural immune response, aiding in the fight against microorganisms by either preventing infections or helping the immune system combat them more effectively.
16. b) Killing all micro-organisms in a material or on an object. Sterilization ensures complete eradication of microorganisms, crucial in medical and laboratory settings.
17. b) Sterilisation of items in intense heat under pressure. Autoclaving is a method widely used for sterilization in healthcare and laboratories.
18. b) Heating food to reduce the number of living micro-organisms. Pasteurization helps extend shelf life by killing harmful pathogens while retaining food quality.
19. a) To reduce the number of living micro-organisms on a surface. Disinfectants are crucial for sanitizing surfaces in healthcare, homes, and public spaces.
20. c) Chemicals applied to living tissue to kill micro-organisms. Antiseptics are vital for disinfecting wounds and preventing infections in healthcare settings.
21. b) By triggering the immune system to produce antibodies against specific pathogens. Vaccination primes the immune system for defense against particular diseases.
22. b) Antibiotics specifically target bacteria and do not harm human cells. Unlike antiseptics and disinfectants, antibiotics are designed to combat bacterial infections internally.
23. b) Live vaccines contain weakened micro-organisms. Live vaccines mimic natural infections, providing robust and long-lasting immunity.
24. c) To kill all micro-organisms present. Ultra-high temperature treatment ensures food safety by eliminating harmful microbes.
25. b) Study of micro-organisms. Microbiology encompasses the study of bacteria, viruses, fungi, and other microscopic organisms.

26. a) Viruses mutate rapidly, making vaccines ineffective. Vaccine development must address viral mutations for long-term effectiveness.
27. b) He identified the microbial causes of several diseases. Pasteur's discoveries laid the foundation for understanding infectious diseases.
28. a) Antiseptics are used on living tissue, while disinfectants are used on inanimate objects. Antiseptics are milder for skin use compared to disinfectants.
29. b) They directly kill bacteria without harming human cells. Antibiotics target specific bacterial mechanisms, aiding in infection control.
30. a) Live vaccines provide longer-lasting immunity. Live vaccines often confer more robust and enduring protection compared to dead vaccines.
31. c) Ingestion of under-cooked meat. Tapeworm infections primarily occur through consuming contaminated meat.
32. b) Plasmodium. Malaria is caused by Plasmodium parasites transmitted through mosquito bites.
33. c) By inhaling airborne bacteria. Tuberculosis spreads through the air when infected individuals cough or sneeze.
34. c) Rehydration with electrolyte-containing fluids. Adequate fluid replacement is crucial in treating Acute Watery Diarrhea (AWD).
35. b) By consuming contaminated food or water. Cholera spreads through contaminated food and water sources.
36. a) Contaminated water or food. Typhoid fever spreads through ingestion of contaminated food or water.
37. d) Through sexual contact. Gonorrhea primarily spreads through sexual intercourse.
38. c) Painful ulcers in the genital area. Syphilis can present with painless sores in the genital area among other symptoms.
39. b) Painful ulcers in the genital area. Chancroid is characterized by painful genital ulcers.
40. a) Ciprofloxacin. Ciprofloxacin is commonly used as the first-line antibiotic treatment for typhoid fever.

STD	Causative Microbe	Cause	Sign and Symptom
Gonorrhoea	Neisseria gonorrhoeae	Sexually transmitted bacterium found in mucus areas of the body	Men: burning sensation while urinating, yellowish-white discharge from the penis. - Women: vaginal discharge, burning sensation while urinating. - Asymptomatic in some cases.
Syphilis	Treponema pallidum	Sexually transmitted spiral-shaped bacterium.	Primary Stage: painless sores, swollen glands. - Secondary Stage: rash, tiredness, fever, sore throat, headaches, hoarseness, loss of appetite, patchy hair loss, swollen glands. - Tertiary Stage: severe and irreversible problems in skin, bones, central nervous system, and heart.
Chancroid	Haemophilus ducreyi	Bacterial STD causing painful genital sores.	- First Stage: sore ulcerations on genitals, filled with pus, bleed easily, painful. - Second Stage: infected lymph glands in the groin, forming 'buboes' filled with pus.

			Permanent tissue loss possibl
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