TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

DPT

AMD 2104 : MEDICAL MICROBIOLOGY 1

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **THREE** choose Sect/Quest. Attempt All questions in section A and B and any two questions in section C.

Circle the correct answer in section A.

SECTION A

1. The significance of the plasma membrane is that

a) it selectively allows some molecules to pass into the organism

b) it prevents movement of molecules out of the organism

c) it is the site of protein synthesis

d) all of the above

2. The most commonly encountered bacteria are roughly spherical. The microbiological term describing this shape is

a) coccus

b) bacillus

c) pleomorphic

d) Vibrio

3. Another common bacterial shape is that of a rod, often called

a) coccus

b) bacillus

c) pleomorphic

d) Vibrio

4. In bacterial cells, ribosomes are packed into the cytoplasmic matrix and also loosely attached to the plasma membrane. What is the function of ribosomes?

a) Site of energy production

b) Site of protein synthesis

c) Site of genetic reproduction

d) Site of excretion

5. What is a plasmid?

a) Self-replicating segment of double stranded DNA

b) Self-replicating segment of single stranded RNA

c) A bacterial chromosome

d) The bacteria genetic material

6. Plasmids are important to the genetics of many bacteria. This is because

a) they are inherited from one generation to the next.

b) they may carry genes that give their host a selective advantage.

c) they can render bacteria drug-resistant.

d) All of the above.

7. Bacteria do not always swim aimlessly but are attracted by such nutrients such as sugar and amino acids, and are repelled by harmful substances and bacterial waste products. Movement toward chemical attractants and away from repellents is called

a) gliding motility.

b) tumbling.

c) chemotaxis.

d) peristalsis

8. Some bacteria are considered pleomorphic. This means

a) they are shaped like bent rods.

b) they have a corkscrew shape.

c) they do not have just one shape.

d) they are not either bacilli or cocci.

9. Gram positive cells

a) have a second, outer membrane that helps retain the crystal violet stain.

b) have multiple layers of peptidoglycan that help retain the crystal violet stain.

c) have a thick capsule that traps the crystal violet stain.

d) have a periplasmic space that traps the crystal violet.

10. The outer membrane of Gram negative cells is more permeable than the plasma membrane because

a) LPS is larger than most membrane phospholipids.

b) lipoproteins stretch the outer membrane.

c) porin proteins establish holes in the outer membrane.

d) the core polysaccharide spans the lipid bilayer.

11. The most important role of the prokaryotic cell wall is to

a) maintain the shape of the cell.

b) protect the cell from osmotic pressures.

c) prevent ions from diffusing away from the cell.

d) block the effects of antibiotics like penicillin.

12. Which of the following is not true about capsules and slime layers?

a) They consist of secreted material lying outside of the bacterial cell wall.

b) They can prevent desiccation of bacteria cells.

c) They are required for bacteria to grow normally in culture.

d) They help bacteria resist phagocytosis by macrophages.

13. Fimbriae

a) attach bacteria to various surfaces.

b) cause bacteria move through fluids.

c) sense changes in nutrient concentration.

d) are pathways for the secretion of exoenzymes.

14. A bacillus bacterium with a single flagellum at each end is described as

a) Monotrichous

b) Amphitrichous

c) Lophotrichous

d) Peritrichous

15. Which of the following is not true about bacterial flagella?

a) Most of their length consists of a hollow, rigid protein tube.

b) They are constructed largely of a single protein called flagellin.

c) They spin like wheels, either clockwise or counterclockwise.

d) They use cytoplasmic ATP as their primary energy source.

16. How does a bacterium control the direction of swimming?

a) The length of the flagellum acts as a rudder to steer the bacterium.

b) The speed of rotation is faster when the bacterium is headed the correct way.

c) The bacterium can stop and spin until it is pointed the correct way.

d) The bacterium does not control the direction of its swimming.

17. Bacteria accomplish chemotaxis by

a) Steering toward better growth conditions.

b) Making long, uninterrupted runs when conditions are good.

c) Frequently stopping and tumbling to better sense good conditions.

d) Stopping movement when conditions are good.

18. What is the purpose of bacterial endospores?

a) Allow the bacterium to make hundreds of "seeds" to spread on the wind.

b) Help the bacterium to differentiate into faster growing stages of bacteria.

c) Allow the bacterium to survive the absence of oxygen.

d) Allow the bacterium to survive extended periods of heat or dryness.

19. Which of the following components of the innate immune system involves the release of histamine?

a) Neutrophil

b) Eosinophil

c) Macrophage

d) Tissue mast cell

20. Which of the following components of the adaptive immune system secretes immunoglobulin (Ig)?

a) Activated B cell (plasma cell)

b) CD4+ activated T cell

c) CD8+ cytotoxic T cell (CTL)

d) Resting lymphocytes (B cell, CD4+ T cell, CD8+ T cell)

21. Which of the following components of the adaptive immune system causes lysis of virally infected cells and the release of cytokines?

a) Activated B cell (plasma cell)

b) CD4+ activated T cell

c) CD8+ cytotoxic T cell (CTL)

d) Resting lymphocytes (B cell, CD4+ T cell, CD8+ T cell)

22. Humoral immunity is mediated by antibodies from ____ and is involved in the elimination of ____ Pathogens. Cell mediated immunity is mediated by ____ and is involved in the elimination of ____ pathogens.

a) B lymphocytes; Intracellular; T lymphocytes; Extracellular

b) B lymphocytes; Extracellular; T lymphocytes; Intracellular

c) T lymphocytes; Intracellular; B lymphocytes; Extracellular

d) T lymphocytes; Extracellular; B lymphocytes; Intracellular

23. T cells are made in the ____ and complete their differentiation in the ____.

a) Spleen; Thyroid

b) Spleen; Thymus

c) Bone marrow; Thyroid

d) Bone marrow; Thymus

24. Phagocytes ingest particular matter into cells for degradation. This of the following is NOT considered phagocyte?

a) Macrophage

b) Eosinophil

c) Basophil

d) Lymphocyte

25. The ____ immune system uses ____ as well as molecules (e.g. complement components). The ____ immune system uses ____ as well as antigen recognition molecules.

a) Adaptive; Phagocytes; Innate; Lymphocytes

b) Adaptive; Lymphocytes; Innate; Phagocytes

c) Innate; Phagocytes; Adaptive; Lymphocytes

d) Innate; Lymphocytes; Adaptive; Phagocytes

26. Which of the following mediates an early response to viral infections by the innate immune system?

a) Complement components

b) T and B lymphocytes

c) Cytokines

d) Interferons

27. Which of the following is a messenger that mediates the connection between the innate and adaptive immune systems?

a) Complement components

b) T and B lymphocytes

c) Cytokines

d) Interferons

28. Viruses range in size from:

a) 1-100 nm

b) 25-300 nm

c) 10-100 μm

d) 400-1000 nm

29. A structural component that is found in all viruses is:

a) The envelope

b) DNA

c) Capsid

d) Spikes

30. The polio virus is transmitted through

a) Respiratory droplets

b) Contact with body fluids

c) Vector transmission

d) Faecal oral transmission

31. Cells respond to viral infection in different ways, which one is not

a. Neutralization

b. Death

c. No apparent change

d. Transformation

32. Direct cell damage and death due to viral infection may result from

a) Inflammation

b) Host immune response

c) Integration of the viral genome

d) Diversion of the cells energy

33. Which of the following drugs inhibits viral penetration?

a) Amantidine

b) Aspirin

c) Ribavirin

d) Forscanet

34. In biosynthesis,

a) The viral nucleic acid is degraded into smaller fragments

b) Transcription of mRNA takes place

c) Bacteriophage nucleic acid is taken into the nucleus.

d) Viral proteins may be produced

35. The following statements are true about viral multiplication except

a) May lead to cell death

b) Occurs only in living cells

c) May lead to synthesis of toxins.

d) May take place without apparent host cell damage

36. Protection against influenza A virus in a nonimmune individual can be achieved through the administration of a drug that interferes with

a) Viral adsorption and penetration

b) binding of host messenger RNA (mRNA) caps by the viral P1 protein

c) Synthesis of viral progeny RNA

d) Uncoating of nucleic acid

37. Which one of the following immunizations should be administered immediately after birth?

a) Diphtheria-pertusis-tetanus (DPT) vaccine

b) Haemophilus influenza

c) Hepatitis B vaccine

d) HIV Vaccine

38. Which one of the following infection routes is most often involved in the neonatal transmission of hepatitis B virus?

a) Blood transfusion

b) Fetal contact with infected blood during childbirth

c) Ingestion of the virus via maternal breast milk

d) Transplacental transmission of the virus

39. Which of the following is TRUE about viruses?

a) Contain both DNA and RNA

b) May have an envelope

c) Have their own metabolism

d) Cell wall

40. Which of the following is a DNA virus?

a) Herpesviruses

b) Orthomyxoviruses

c) Enteroviruses

d) Parvoviruses

SECTION B

41. List four physical barriers involved in the first line of defense (4mks)

42. List the four types of immunoglobulins (4mks)

43. Highlight four types of flagella (4mks)

44. Using illustrations outline four morphological shapes of bacteria (4mks)

45. Highlight four characteristics of adaptive immunity (4mks)

46. Outline 4 characteristics of viruses (4mks)

47. Highlight the four differences between viruses and bacteria (4mks)

48. Outline the difference between enveloped and non-enveloped virus (4mks)

49. Outline four ways the bacteria concurs the destruction by the immune system (4mks)

50. List four diseases which can be characterized as nosocomial infections (4mks)

SECTION C

51. Draw a well labelled illustration of;

i. Bacteria cell (10mks)
ii. Virion (10mks)

52. a) Discuss the various types of vaccines citing relevant examples (10mks)

b) Discuss the mechanism of action of antibiotics (10mks)

53. Citing relevant examples in each mode, discuss the transmission routes of bacteria and viruses. (20mks)