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Ph.D. ENTRANCE EXAMINATION - 2020

Subject : Microbiology

Date : 06.01.2020

Max Marks: 60

Duration: 01:30 Hrs.

Place : Dehradun

Student Name:

Invigilator Name:

Signature:

Signature:

1. The dye eosinate of methylene blue belongs to which group?

- a) Acidic dye
- b) Basic dye
- c) **Neutral dye**
- d) Oxazine dye

2. What is the correct order of staining reagents in Gram-Staining?

- a) Crystal violet, alcohol, iodine solution, safranin
- b) **Crystal violet, iodine solution, alcohol, safranin**
- c) Crystal violet, safranin, alcohol, iodine solution
- d) Iodine solution, crystal violet, alcohol, safranin

3. Which bacteria appears purple-violet colour after staining?

- a) **Gram-positive**
- b) Gram-negative
- c) Both Gram-positive and Gram-negative
- d) Neither Gram-positive nor Gram-negative

4. Which of the following are true for Gram-negative bacteria?

- a) upon alcohol treatment, the permeability of the cell wall increases
- b) crystal violet-iodine (CV-I) complex is extracted
- c) pore size decreases and the CV-I complex cannot be extracted
- d) **alcohol treatment increases the permeability of the cell wall and the CV-I complex can be extracted**

5. Gram-positive bacteria are usually more susceptible to?

- a) streptomycin
- b) tetracyclin
- c) **penicillin**
- d) ampicillin

6. Which of the staining technique helps in demonstrating spore structure in bacteria as well as free spores?

- a) Acid-fast stain
- b) Endospore stain
- c) **Capsule stain**
- d) Flagella stain

7. In Gram-staining, iodine is used as a _____

- a) fixative
- b) mordant
- c) solublizer
- d) stain

8. Which of the following is the example of Gram-negative bacteria?

- a) Lactobacillus
- b) *Eschericia coli*
- c) Staphylococcus aureus
- d) Bacillus subtilis

9. Which of the following is used in electron microscope?

- a) electron beams
- b) magnetic fields
- c) light waves
- d) electron beams and magnetic fields

10. Electron Microscope can give a magnification up to _____

- a) 400,000X
- b) 100,000X
- c) 15000X
- d) 100X

11. Which group of bacteria among the following have the largest area of contact?

- a) Palisades
- b) *Trichomes*
- c) Streptobacilli
- d) Diplobacilli

12. Which of the following are functions of stalk?

- a) nutrient absorption
- b) motility
- c) attachment of the cells to surfaces
- d) human infection

13. *Salmonella typhi* has which type of flagella arrangement?

- a) Amphitrichous
- b) *Peritrichous*
- c) Monotrichous
- d) Lophotrichous

14. The L Ring in a Gram-Negative bacterium flagella is associated with_____

- a) Peptidoglycan
- b) **Outer Membrane**
- c) Cytoplasmic Membrane
- d) Cell Membrane

15. F pilus has a major role as_____

- a) motility of the cell
- b) **port of entry of genetic material during mating**
- c) attachment to host cell
- d) human infection

16. Prosthecae helps in _____

- a) motility
- b) **nutrient absorption and attachment to surfaces**
- c) human infection
- d) protection from environment

17. When a bacteria swim towards a chemical, it is termed as_____

- a) **positive chemotaxis**
- b) phototaxis
- c) negative chemotaxis
- d) magnetotaxis

18. Which type of force drives the flagellar motion?

- a) **Protonmotive force**
- b) ATP driven
- c) Protonmotive and ATP driven
- d) No protonmotive nor ATP driven

19. Peptidoglycan is made up of _____

- a) N-acetylglucosamine
- b) N-acetylmuramic acid
- c) N-acetylglucosamine, N-acetylmuramic acid
- d) **N-acetylglucosamine,N-acetylmuramicacid,amino acids**

20. Teichoic acid present in Gram-positive bacteria can bind to which ion?

- a) Fe ions

- b) Phosphorus ions
- c) **Mg ions**
- d) Sulphur ions

21 **Cord factor is a _____**

- a) protein
- b) teichoic acid derivative
- c) **mycolic acid derivative**
- d) carbohydrate

22. **The outer membrane of the Gram-negative cell wall is anchored to the underlying peptidoglycan by means of which of the following?**

- a) **Braun's Lipoprotein**
- b) Phospholipids
- c) Proteins
- d) Lipopolysaccharide

23. **NAG and NAM of peptidoglycan layer is linked by _____**

- a) **beta-(1,4) glycosidic linkage**
- b) alpha-(1,4) glycosidic linkage
- c) alpha-(1,6) glycosidic linkage
- d) beta-(1,6) glycosidic linkage

24. **Which of the following methods can be utilized for removing peripheral proteins of the cytoplasmic membrane?**

- a) treatment by detergents
- b) **osmotic shock**
- c) heat application
- d) destruction of the membrane

25. **Which of the following are functions of water in the culture medium?**

- a) nutrients must be in aqueous solution
- b) cofactor of enzymes
- c) provides resistance to sudden transient temperature changes
- d) **it is a chemical reactant, nutrients must also be present in aqueous solution and provides resistance to sudden temperature changes.**

26. **The isolation of gonorrhoea-causing organism, Neisseria gonorrhoeae by the use of certain antibiotics in media is an example of which of the following?**

- a) **Selective media**
- b) Differential media
- c) Enriched media
- d) Assay media

27. Nutrient broth, a liquid media contains beef extract and peptone respectively in how much amounts?

- a) 0.2%, 0.4%
- b) 0.1%, 0.6%
- c) 0.3%, 0.5%**
- d) 0.7%, 0.3%

28. Which of the following instrument is used for sterilizing the media after it has been prepared?

- a) Autoclave**
- b) Laminar Air Flow Chamber
- c) Inoculum Needle
- d) Incubator

29. Which of the following is a Complex media for fungal growth?

- a) Nutrient broth
- b) Luria-Bertani media
- c) Potato Dextrose Agar(PDA) media**
- d) Mac Conkey Agar media

30. Which of the following bacteria requires nicotinic acid as a growth factor in their media?

- a) Proteus vulgaris**
- b) Nitrosomonas sp.
- c) E. coli
- d) Leuconostocmesenteroides

31. Which of the following factors are responsible for the stability of thermophiles at high temperatures?

- a) increased leakage of cell components
- b) presence of large no. of polar amino acids and alpha-helix protein
- c) thermal stability of ribosomes
- d) presence of Inositol diphosphate and thermal stability of ribosomes**

32. The bacterium Staphylococcus aureus is which type of bacteria?

- a) Psychrophile
- b) Mesophile**
- c) Thermophile
- d) Mesophile and psychrophile

33. The Reactive Oxygen Species(ROS) produced by some bacteria are degraded by which of the following enzymes?

- a) Peroxidase
- b) Lyase
- c) Catalase
- d) **Superoxide dismutase, Catalase and Peroxidase**

34. HIV is transmitted by all of the following routes except:

- a) **Saliva**
- b) Needle prick injury
- c) Blood transmission
- d) Sexual intercourse

35. A rise in the anti-HBc immunoglobulin in a patient indicates

- a) **Acute infection**
- b) Carrier state
- c) Prodromal phase
- d) Convalescence

36. All of the following infections may be transmitted by dental instruments except:

- a) HIV
- b) Hepatitis C
- c) Hepatitis B
- d) **Hepatitis E**

37. The culture media used for cultivation of HSV is

- a) Chocolate agar
- b) Robertson's cooked-meat broth
- c) **Chorioallantoic membrane**
- d) Sabourad's agar

38. The causative organism of syphilis is:

- a) Borrelia burgdorferi
- b) Chlamydia trachomatis
- c) Leptospira interrogans
- d) **Treponema pallidum**

39. On a stained slide, Clostridium tetani has the appearance of a:

- a) Bunch of a
- b) Chain of beads
- c) **Drum stick**
- d) Safety pin

40. An oxidase-positive, gram-negative rod which produces a bluish-green pigment has been grown in culture from a swab obtained from an infected burn wound. This organism is susceptible to gentamicin, ticarcillin and tobramycin, but resistant to all the other antibiotics which of the following organisms is it likely to be?

- a) Escherichia coli
- b) Klebsiella pneumoniae
- c) Proteus mirabilis
- d) **Pseudomonas aeruginosa**

41. **In initial stages of typhoid, salmonella can be detected in:**

- a) Faecus
- b) Urine
- c) **Blood**
- d) All of the above

42. **Signs of typhoid fever is/are**

- a) Haemorrhage
- b) perforation
- c) Osteomyelitis
- d) **All of the above**

43. **All of the following are true of streptococcus except:**

- a) **It's group of lactic acid production bacteria**
- b) Shows adherence to dental enamel
- c) Most common in humans
- d) Most common in animals

44. **Electron microscopic examination of the bacterial flora of necrotising ulcerative gingivitis indicates the presence of microorganisms within non-necrotic tissues in advance of other bacteria. The organisms involved are:**

- a) Cocci
- b) **Spirochetes**
- c) Bacteriophages
- d) Filamentous rods

45. **The following are applicable to bacterial genomes except:**

- a) It is composed of DNA
- b) It does not contain histones
- c) It is circular
- d) **Its DNA has both introns and exons**

46. **The commonest method of detection of diphtheria carriers is:**

- a) **Schick test**
- b) Dick test
- c) Casoni's test
- d) Charles' test

47. **Each of the following can cause food poisoning except:**

- a) **Cl. Difficile**
- b) Staphylococcus
- c) Cl. Welchii
- d) Cl. botulinum

48. **Germ tubes are formed mainly by:**

- a) **Candida albicans**
- b) Candida stellatoidea
- c) Candida tropicalis
- d) Candida pseudotropicalis

49. **Fungus capable of forming fungal ball is:**

- a) Penicillium
- b) **Aspergillus**
- c) Mucor
- d) Rhizopus

50. A sporangium contains:

- a) Spherules
- b) **Porangiospores**
- c) Chlamydo-spores
- d) Oidia

51. Transmission of all of the following intestinal parasites takes place by the feco-oral route except:

- a) Giardia lamblia
- b) Ascaris lumbricoides
- c) **Strongyloides**
- d) Entamoeba

52. Hydatid cyst is:

- a) **Parasitic in nature**
- b) Fungal
- c) Congenital
- d) Viral

53. Investigation of choice for invasive amoebiasis is:

- a) Indirect hemagglutination
- b) **ELISA**
- c) Counter immune electroporesis
- d) Microscopy

54. L.D bodies are seen in:

- a) **Kalahaza**
- b) Toxoplasmosis
- c) Malaria
- d) Sleeping sickness

55. Parasitic inflammation would show predominantly

- a) Lymphocytes
- b) Neutrophils
- c) **Eosinophils**
- d) Basophils

56. Amoebae are seen in a cyst of E. histolytica except:

- a) Glycogen mass
- b) Chromatid bars
- c) Eccentric nucleus
- d) Refractile nucleus

57. Example of immune complex hyper-sensitivity reaction is:

- a) Atopic allergy
- b) **Serum sickness**
- c) Transfusion reaction
- d) Contact dermatitis

58. Cysticercosis cellulosae is caused by:

- a) **T. solium.**
- b) Echinococcus granulosus
- c) T. Saginata
- d) H. nana

59. The predominant immunoglobulin in saliva is:

- a) IgA
- b) IgD
- c) IgE
- d) IgG

60. Steam under pressure is used in ___ sterilization

- a) Pasteurization
- b) Autoclave
- c) Kochs sterilizer
- d) hot air oven

