



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN MEDICAL LABORATORY SCIENCES

AML 1215 : MEDICAL BACTERIOLOGY II

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 **TWO** Section(s). Attempt ALL questions.

Circle the correct answer in section A.

Section A

1. The following grows in the presence of 65% sodium chloride but are inhibited by penicillin
 - a. *Streptococcus bovis*
 - b. *Streptococcus pyogenes*
 - c. *Staphylococcus epidermidis*
 - d. *Staphylococcus aureus*
2. The following is true about *Klebsiella pneumoniae* except
 - a. A lactose fermenter
 - b. Its citrate positive
 - c. Causes nasocomial infections
 - d. Its motile
3. *Streptococcus pyogenes* are differentiated from other hemolytic streptococci by
 - a. Optochin sensitivity
 - b. Bacitracin sensitivity
 - c. Penicillins

- d. Camp test
- 4. *Streptococcus pneumoniae* may be presumptively identified by
 - a. Bile solubility test
 - b. Litmus milk decolourisation test
 - c. Campy test
 - d. Aesculin hydrolysis
- 5. *E. coli* was first described in 1885 as a Bacterium after being isolated from the faeces of newborns. This was done by
 - a. Van Leeuwenhoek
 - b. Louis Pasteur
 - c. Theodor Escherich
 - d. Robert Koch
- 6. The following is used for sputum decontamination
 - a. 10% sodium chloride
 - b. 4% sodium hydroxide
 - c. 10% potassium hydroxide
 - d. 4% potassium hydroxide
- 7. The following grows in the presence of 65% sodium chloride but are inhibited by penicillin
 - a. *Streptococcus bovis*
 - b. *Streptococcus pyogenes*
 - c. *Staphylococcus epidermidis*
 - d. *Staphylococcus aureus*
- 8. The following is true about *Klebsiella pneumoniae* except
 - a. A lactose fermenter
 - b. Its citrate positive
 - c. Causes nosocomial infections
 - d. Its motile
- 9. In a situation where TSI reads ALK/ALK, H₂S won't be detected. This could be due to;
 - a) H₂S diffuses in to the media
 - b) There is no reduction of thiosulphate
 - c) Alkalinity of media
 - d) Sucrose fermentation inhibit H₂S production
- 10. Hydrogen sulphide production may be detected through the use of the following media except;
 - a) Sorbitol macConkey
 - b) Kligler iron agar
 - c) Lactose egg yolk media
 - d) Xylose Lysine Deoxcholate media
- 11. The following is used for sputum decontamination
 - a. 10% sodium chloride
 - b. 4% sodium hydroxide
 - c. 10% potassium hydroxide
 - d. 4% potassium hydroxide

12. *Streptococcus faecalis* may be presumptively identified by
- Bile solubility test
 - Litmus milk decolourisation test
 - Campy test
 - Aesculin hydrolysis
13. The period between inoculation of bacteria in a culture medium and beginning of multiplication is known as
- Lag phase
 - Log phase
 - Decline phase
 - Stationery phase
14. All bacteria that inhabit the human body are
- Autotrophs
 - Heterotrophes
 - Phototrophs
 - Chemolithotrophs
15. The following grows in the presence of 40% bile but are inhibited by penicillin
- Streptococcus bovis*
 - Streptococcus pyogenes*
 - Staphylococcus epidermidis*
 - Staphylococcus aureus*
16. The Gram stain was developed in 1884 by
- Hans Christian
 - Alexander Loeb
 - Van Leeuwenhoek
 - Graham's son
17. Oxidase test is negative in
- Neisseria
 - Pseudomonas
 - Escherichia
 - Proteus
18. Urease test is positive in
- Klebsiella pneumonia*
 - Shigella flexneri*
 - Proteus vulgaris*
 - Salmonella typhi*
19. The reason why some H₂S producers may fail to do so in Triple Sugar Iron agar may be;
- Because of the competitive fermentation of lactose and/or glucose
 - Absence of thiosulphatase in the subject organism
 - Sucrose fermentation affects enzymic reduction of thiosulphate
 - Increased acidity inhibits thiosulphate reduction
20. Gram staining is an example of
- Simple staining
 - Differential staining
 - Negative staining
 - None of these

21. Rod shaped bacteria are known as
- Cocci
 - Comma forms
 - Bacilli
 - Plemorphic froms
22. The action of alcohol during Gramstaining is
- Allows the color to penetrate cells
 - It adds color
 - Decolourises the cells
 - Fixes the cell
23. The order of stains in Gram-staining procedure is
- Crystal violet, Iodine solution, Alcohol, Saffranine
 - Iodine solution, Crystal Violet, Saffranine, Alcohol
 - Alcohol, Crystal Violet, Iodine solution, Saffranine
 - Crystal violet, Alcohol, iodine solution, Saffranine
24. Infection that results in pus formation are called
- Pyrogenic infection
 - Acute infection
 - Pyogenic infection
 - Chronic infection
25. Among the following, β -haemolytic bacteria is
- Streptococcus pyogenes*
 - Streptococcus pneumoniae*
 - Streptococcus viridans*
 - Streptococcus faecalis*
26. α -haemolytic streptococci are also known as
- Streptococcus pyogenes*
 - Virulence group
 - Viridans group
 - Rhinitis group
27. Streptolysin O is inactivated by
- CO₂
 - Nitrogen
 - Oxygen
 - Serum
28. Streptolysin 'S' is
- Oxygen unstable
 - Thermostable
 - Oxygen stable
 - None of these
29. *Staphylococcus aureus* are characterized by
- Formation of acid in sucrose, dextrose
 - Liquification of gelatin due to production of gelatinase

- c. Strains are catalase positive
 - d. Strains are coagulase negative
30. Peptone water medium is an example for
- a. Enriched medium
 - b. Basic medium
 - c. Differential medium
 - d. Enrichment medium
31. Isolation is
- a. Purification of culture
 - b. Introduction of inoculum
 - c. Separation of a single colony
 - d. To grow microorganisms
32. Blood agar medium is
- a. Enrichment medium
 - b. Enriched medium
 - c. Selective medium
 - d. Basic medium
33. To differentiate lactose and non-lactose fermentors, medium used is
- a. Chocolate agar
 - b. Blood Agar
 - c. Tetra thionate broth
 - d. Mac-Conkey's Agar
34. Cultures prepared by penetrating the inoculation loop with suspension into the medium are called
- a. Stock cultures
 - b. Stab cultures
 - c. Sub-cultures
 - d. Pour plates
35. A common laboratory method of cultivating anaerobic micro-organisms is
- a. Gas pack system
 - b. Brewer jar system
 - c. Pyrogallic acid over the cotton
 - d. CO₂ incubator
36. On Mac Conkey's medium Escherichia Coli forms
- a. Colourless colonies
 - b. Greenish pigmentation
 - c. Pink coloured colonies
 - d. Medusa head appearance
37. The major constituents in agar are
- a. Fats
 - b. Aminoacids
 - c. Polysaccharides
 - d. Polypeptides

38. Cells are active and synthesizing new protoplasm at
- Lag phase
 - Stationary phase
 - Log phase
 - Decline phase
39. The organisms which can grow both in presence and absence of oxygen
- Aerobes
 - Anaerobes
 - Facultative anaerobes
 - Strict aerobes
40. The organisms which can grow best in the presence of a low concentration of oxygen
- Aerophilic
 - Microaerophilic
 - Aerobic
 - Anaerobic

Section B

- A diarrheic stool sample from infant was cultured on XLD and MacConkey. The suspect organism produced yellow and pinkish-red colonies respectively which revealed gram negative rods on microscopy. Other tests were as follows; Indole positive, Glucose fermented with acid and gas production, Methyl red was positive, Urease negative, Citrate negative and Voges proskauer test negative.
 - Explain the possible TSI reaction for the organism. (10 marks).
 - Describe any four diagnostic differences between *Klebsiella pneumonia* and *Escherichia coli*. (10 marks).
- Outline and give significance of;
 - Urea test (5 marks)
 - Catalase test (5 marks)
 - Lactose fermentation test (5 marks)
 - Bile solubility test (5 marks)
- Explain;
 - Four (4) constituents of media (10 marks)
 - Gram staining technique (10 marks)

