

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION
RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
NURSING**

NURS 223: MEDICAL MICROBIOLOGY

STREAMS: BSc. Nursing (Y2S1)

TIME: 2 HOURS

DAY/DATE: TUESDAY 02/11/2021

2.30 A.M - 4.30 A.M.

INSTRUCTIONS:

- Do not write anything on the question paper.
- Mobile phones and any other reference materials are NOT allowed in the examination room.
- The paper has THREE sections. Answer ALL questions.
- Answers for SECTION A should be on first page of the answer booklet.
- Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet

PART I: MULTIPLE CHOICE/ SINGLE ANSWER QUESTIONS (20 MARKS)

1. A patient with a peptic ulcer was admitted to the hospital and a gastric biopsy was performed. The tissue was cultured on chocolate agar incubated in a microaerophilic environment at 37°C for 5 to 7 days. At 5 days of incubation, colonies appeared on the plate and were curved, Gram-negative rods, oxidase-positive. The most likely identity of this organism is
 - a. *Campylobacter jejuni*
 - b. *Vibrio parahaemolyticus*
 - c. *Haemophilus influenza*
 - d. *Helicobacter pylori*
2. A patient who is five days post-laparotomy experiences non-bloody diarrhea with marked neutrophilia in the stool. During the pre-operative period he was put on neomycin to

sterilize the gut. The most probable micro-organism responsible is _____

3. After attending a party in which reheated fried rice was served with fried beef, a college student reports to the out patient facility six hours later complaining of nausea and vomiting. The most probable micro-organism responsible is _____

4. A patient experiences excruciating pain in a wound on the lower limb. On examination the nurse notes that there is crepitation on palpation of the surrounding tissues. A pus swab inoculated on blood agar exhibit double zone hemolysis. The nurse concludes the organism responsible is _____
5. A patient admitted with a problem of food and fluid regurgitation. On examination the nurse notes that there is a gray membrane covering the tonsils and throat. The nurse concludes the most probable cause of the infection is _____
6. A school teacher who has been relatively well is admitted unconscious. A spinal fluid specimen is drawn and mixed with Indian ink. Oval budding capsulated yeast is microscopically observed. Based on the findings, the nurse concludes the patient has _____ infection.
7. *L. monocytogenes* causes a variety of diseases, including food poisoning. *Listeria* are small, Gram-positive, motile rod-shaped bacteria. Which of the following best describes these microorganisms?
 - a. *Listeria* are facultative intracellular pathogens
 - b. Once infected, the immune system cannot destroy *Listeria*
 - c. *Listeria* cannot be cultivated on artificial media
 - d. Flagella are produced both at room temperature and at 37°C
8. Symptoms of *C. botulinum* food poisoning include double vision, inability to speak, and respiratory paralysis. These symptoms are consistent with
 - a. Invasion of the gut epithelium by *C. botulinum*

- b. Secretion of an enterotoxin
 - c. Endotoxin shock
 - d. Ingestion of a neurotoxin
9. A man who has a penile chancre appears in a hospital's emergency service. The VDRL test is positive. The most appropriate course of action for the clinician would be to
- a. Perform a Gram stain on the chancre fluid
 - b. Start the man on appropriate antibiotics
 - c. Perform dark-field microscopy for treponemes
 - d. Swab the chancre and culture on Thayer-Martin agar
10. A child is brought to an emergency room because of an infected dog bite. The wound is found to contain small Gram-negative rods. The most likely cause of infection is
- a. *E. coli*
 - b. *H. influenza*
 - c. *Pasteurella multocida*
 - d. *Brucella canis*
11. If a quellung test was done on the following bacterial isolates, which one would you expect to be positive?
- a. *S. pneumonia*
 - b. *Enterobacter*
 - c. *Haemophilus parainfluenzae*
 - d. *C. diphtheria*
12. A patient appeared in the emergency room with a submandibular mass. A smear was made of the drainage and a bewildering variety of bacteria were seen, including branched, Gram-positive rods. The most clinically appropriate action is
- a. Do no further clinical workup
 - b. Suggest to the laboratory that low colony counts may reflect infection

- c. Determine if fluorescent microscopy is available for the diagnosis of actinomycosis
 - d. Consider vancomycin as an alternative drug
13. *Brucella abortus*, one of the three species causing brucellosis, a possible bioterrorism agent, is best described by which of the following statements?
- a. Commonly inhabits the canine respiratory tract and is an occasional pathogen for humans; strongly urease-positive
 - b. Pits agar, grows both in carbon dioxide and under anaerobic conditions, and is part of the normal oral cavity flora
 - c. Typically infects cattle, requires 5 to 10% carbon dioxide for growth, and is inhibited by the dye thionine
 - d. Typically is found in infected animal bites in humans and can cause hemorrhagic septicemia in animals
14. A section of tissue from the foot of a person assumed to have eumycotic mycetoma shows a white, lobulated granule composed of fungal hyphae. The most common etiologic agent of this condition is a species of
- a. *Acremonium*
 - b. *Nocardia*
 - c. *Actinomyces*
 - d. *Pseudallescheria (Petriellidium)*
15. Which of the following mycoplasmas has been implicated as a cause of nongonococcal urethritis (NGU)?
- a. *Mycoplasma hominis*
 - b. *M. pneumonia*
 - c. *M. fermentans*
 - d. *Ureaplasma urealyticum*
16. Rhinovirus is primarily transmitted by
- a. Droplet aerosolization
 - b. Sexual activity
 - c. Fecal-oral route
 - d. Fomites

17. Transfer of a donor chromosome fragment by a temperate bacterial virus is defined as

18. The paramyxovirus that causes the syndrome known as croup is

- a. Adenovirus
- b. Parainfluenza virus
- c. Influenza virus
- d. Respiratory syncytial virus

19. *H. capsulatum*, a dimorphic fungus, is found in soil heavily contaminated with bird droppings. Which of the following statements best describes the presence of the organism in tissue biopsies?

- a. Oval budding yeasts inside macrophages
- b. Yeasts with broad-based bud
- c. Single-cell yeasts with pseudohyphae
- d. Spherules containing endospores

20. The Human Immunodeficiency Virus (HIV) is a

- a. Double stranded RNA virus
- b. Double stranded DNA virus
- c. Single stranded RNA virus
- d. Single stranded DNA virus

SHORT ANSWER QUESTIONS: 40 MARKS

1. Discuss the antigenic composition of *Staphylococcus aureus* (5 marks)
2. List four (4) virulent factors of *Cryptococcus neoformans* (4 marks)
3. State six (6) virulent factors associated with *S. aureus* (6 marks)
4. Describe the pathogenesis of *Clostridium tetani* infection (5 marks)
5. *Pseudomonas* is a major cause of hospital-acquired infections among people with lowered body immunity. State five (5) virulent factors of *Pseudomonas* (5 marks)

6. Describe the pathogenesis of *Varicela Zoster* infection (4 marks)
7. Describe the properties of *Bordetella pertusis* (5 marks)
8. Describe viral growth cycle (6 marks)

LONG ANSWER QUESTIONS (40 Marks). ANSWER ALL QUESTIONS

1. *Streptococcus pyogenes* is a major bacterial pathogen of medical importance.
 - a. Describe five (5) pathogenic features of *streptococcus pyogenes* (10 marks)
 - b. Describe the laboratory diagnosis of streptococcal infection (4 marks)
 - c. Describe treatment, prevention and control of streptococcal infections (6 marks)

 2. Pulmonary tuberculosis is a major cause of morbidity and mortality in developing countries.
 - a. Describe five (5) properties of *Mycobacterium tuberculosis* that influence its pathogenicity (10 marks)
 - b. Outline the diagnostic tests used in of *Mycobacterium tuberculosis* infections (4 marks)
 - c. State four (4) methods that can be adopted in prevention and control of *M.tuberculosis* infections (4 marks)
-