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**UNIVERSITY EXAMINATIONS 2023/2024  
ACADEMIC YEAR**

**SECOND YEAR FIRST SEMESTER**

**MAIN EXAMINATION**

**FOR BACHELOR OF SCIENCE IN NURSING DEGREE**

**COURSE CODE: NUR 213**

**COURSE TITLE: MEDICAL MICROBIOLOGY AND  
PARASITOLOGY**

**DATE: 6/12/2023**

**TIME: 9AM-12PM**

**INSTRUCTIONS TO CANDIDATES**

Answer ALL Section one (1) MULTIPLE CHOICE QUESTIONS and ALL Section two (2) SHORT ANSWER QUESTIONS and any one (1) section THREE (3) LONG ANSWER QUESTION.

**TIME: 3 Hours**

**SECTION 1 (MULTIPLE CHOICE QUESTIONS) (50 MARKS)**

- Q1. In which age group is respiratory syncytial virus cause severe infections?
- a) School-age children
  - b) Adolescents
  - c) Infants in the first year of life
  - d) Elderly adults
- Q2. What is a potential risk associated with hepatitis B infection?
- a) Risk for respiratory infections
  - b) Risk for bone deformities
  - c) Risk for cirrhosis and hepatocellular carcinoma
  - d) Risk for heart disease
- Q3. Which microorganisms contain the presence of lipopolysaccharide in their cell walls?
- a) Algae
  - b) Fungi
  - c) Gram-negative bacteria
  - d) Gram-positive bacteria
- Q4. Smallpox disease was officially declared eradicated in which year?
- a) 1977
  - b) 1980
  - c) 1990
  - d) 2000
- Q5. What is the key function of a vaccine in relation to the body's immune system?
- a) To weaken the immune system
  - b) To stimulate the immune system to recognize and destroy disease agents
  - c) To introduce live, virulent microorganisms into the body
  - d) To provide immediate treatment for existing diseases
- Q6. What is the primary purpose of a prophylactic vaccine?
- a) To treat a disease that has already occurred
  - b) To prevent or ameliorate the effects of a future infection
  - c) To stimulate the immune system to destroy a disease
  - d) To provide full sterilizing immunity
- Q7. The scientist who used the Chamberland filter to show that the infectious agent of the tobacco mosaic virus could pass through it was \_\_\_\_\_?
- a) Dmitry Ivanovsky
  - b) Adolf Mayer
  - c) Martinus Beijerinck
  - d) Louis Pasteur
- Q8. In 1881 \_\_\_\_\_ discovered yellow fever virus which is transmitted by mosquitoes?
- a) Martinus Beijerinck
  - b) Friedrich Loeffler
  - c) Carlos Finlay

d) Walter Reed

Q9. What is the primary mode of transmission for enteroviruses?

- a) Respiratory droplets
- b) Sexual contact
- c) Oral-fecal route
- d) Bloodborne transmission

Q10. Which viral species is mainly responsible for causing the common cold and exacerbations of asthma and chronic bronchitis?

- a) Rhinovirus
- b) Enterovirus
- c) Parechovirus
- d) Coxsackie virus

Q11. Who is credited with the invention of vaccination?

- a) Watson
- b) Jenner
- c) Crick
- d) Pasteur

Q12. How is hepatitis B primarily transmitted?

- a) Through respiratory droplets
- b) By consuming contaminated food or water
- c) Parenterally, sexually, or from mother to baby
- d) Through casual contact with infected individuals

Q13. The process that ensures the complete destruction of all living cells, viruses, and spores from an object is referred to as \_\_\_\_\_?

- a) Disinfection
- b) Sterilization
- c) Antisepsis
- d) Pasteurization

Q14. What is the main reservoir for *Mycobacterium leprae*, aside from humans?

- a) Wild armadillos
- b) Rats
- c) Domestic dogs
- d) Monkeys

Q15. Which condition is primarily associated with *K. pneumoniae*?

- a) Urinary tract infections
- b) Chest infection and bronchopneumonia
- c) Surgical wound infections
- d) Gastrointestinal infections

Q16. Which *Klebsiella* species is commonly associated with hospital-acquired infections of the wound and urinary tract, and may also infect immunocompromised patients?

- a) *K. pneumoniae*
- b) *K. oxytoca*

- c) *K. aerogenes*
- d) *K. malnourished*

Q17. Which of the following biochemical processes can be used to identify *Shigella* species?

- a) H<sub>2</sub>S production
- b) Urease production
- c) Nitrate reduction to nitrites
- d) Lysine decarboxylase production

Q18. The following is one of the clinical presentations of shigellosis?

- a) Large volume of watery diarrhea
- b) Severe dehydration with no other symptoms
- c) Dysentery with a small volume of bloody stools
- d) Persistent vomiting with no diarrhea

Q19. The following is a strongly suggestive sign of shigellosis that can aid in diagnosis?

- a) Presence of fresh blood in the urine
- b) Neutrophils in fecal smears
- c) Elevated lymphocyte count in the blood
- d) Elevated platelet count in the blood

Q20. Which component of the bacterial cell envelope is specifically associated with Gram-negative bacteria and is essential in conferring pathogenicity?

- a) Periplasm
- b) Cytoplasmic membrane
- c) Outer membrane
- d) Cell wall

Q21. The antibiotics commonly used to treat severe dysentery caused by *Shigella* infections?

- a) Penicillin and erythromycin
- b) Ampicillin and ciprofloxacin
- c) Tetracycline and doxycycline
- d) Azithromycin and metronidazole

Q22. The scientist that discovered bacteria using a single-lens microscope and called them "animalcules"?

- a) Louis Pasteur
- b) Antonie van Leeuwenhoek
- c) Robert Koch
- d) Joseph Jackson Lister

Q23. Who is known for discovering that some bacteria could be stained blue with crystal violet?

- a) Louis Pasteur
- b) Robert Koch
- c) Hans Christian Gram
- d) Joseph Jackson Lister

Q24. Which term describes bacterial cells that are round in shape?

- a) Bacillus
- b) Coccobacilli
- c) Cocci
- d) Fusiform

Q25. The cellular arrangement of most clinically important bacteria in terms of their size?

- a) 1 to 3  $\mu\text{m}$  in width and 0.25 to 1  $\mu\text{m}$  in length
- b) 0.25 to 1  $\mu\text{m}$  in width and 1 to 3  $\mu\text{m}$  in length
- c) 1 to 3  $\mu\text{m}$  in both width and length
- d) 0.25 to 1  $\mu\text{m}$  in both width and length

Q26. How do Gram-positive bacteria typically appear when subjected to the Gram stain?

- a) Stain pink to blue
- b) Stain deep blue
- c) Stain deep red
- d) Stain yellow to red

Q27. What is the primary component of the cell wall in both Gram-positive and Gram-negative bacteria?

- a) Peptidoglycan
- b) Lipopolysaccharide
- c) Cellulose
- d) Chitin

Q28. Which of the following antigen is NOT possessed by salmonella bacteria.

- a) O antigen
- b) H antigen
- c) iV antigen
- d) Vi antigen

Q29. What is considered the most effective control strategy for preventing shigellosis transmission?

- a) Treatment with antibiotics
- b) Avoiding contaminated water sources
- c) Personal hygiene and handwashing
- d) Vaccination

Q30. What type of structure is found scattered around the lipopolysaccharide layer in the outer membrane of Gram-negative bacteria?

- a) Ribosomes
- b) Flagella
- c) Porins
- d) Plasmids

Q31. What the alternative treatment for Pityriasis versicolor other than ketoconazole shampoo ?

- a) Hydrocortisone cream

- b) Zinc oxide lotion
- c) Selenium sulfide lotion or zinc pyrithione shampoo
- d) Acetaminophen solution

**Q32.** The primary symptom of white piedra infection on the hair shaft caused by *Trichosporon beigeli*?

- a) Reddish nodules along the hair shaft
- b) Greyish-white nodules
- c) Hard, black nodules
- d) Greenish discoloration of the hair

**Q33.** The regions of the body that white piedra is localized, other than face and pubic hair?

- a) Fingernails and toenails
- b) Scalp and axilla
- c) Elbows and knees
- d) Trunk and groin

**Q34.** The primary site of infection for dimorphic systemic mycoses following the inhalation of conidia?

- a) Skin
- b) Gastrointestinal tract
- c) Pulmonary
- d) Urinary tract

**Q35.** How do dimorphic fungal pathogens overcome the physiological and cellular defenses of the normal human host in dimorphic systemic mycoses?

- a) By producing toxins
- b) By changing their morphological form
- c) By secreting enzymes
- d) By inducing fever

**Q36.** What is the primary focus of mycology in the field of microbiology?

- a) The study of bacteria and viruses
- b) The study of fungi, including their genetic and biochemical properties
- c) The study of plants and their interactions with fungi
- d) The study of human diseases caused by fungi

**Q37.** Before the advances in DNA technology, fungi were assumed to be \_\_\_\_\_?

- a) Fungi were considered a type of plant.
- b) Fungi were known to be eukaryotes with unique cell walls.
- c) Fungi were considered a type of animal.
- d) Fungi were believed to be a form of bacteria.

**Q38.** Which of the following statement is true about a Virion?

- a. A complete virus particle that consists of an RNA core with a protein coat sometimes with external envelopes.
- b. A complete virus particle that consists of DNA core with a protein coat sometimes with external envelopes.
- c. A complete virus particle that consists of an RNA or DNA core with a protein coat sometimes with external envelopes.

- d. A complete virus particle that consists of an RNA or DNA core without a protein coat sometimes with external envelopes.

Q39. The following is an acute viral infection \_\_\_\_\_?

- a. Mumps
- b. Hepatitis B
- c. HIV
- d. Herpes simplex

Q40. The formal study of fungi begun in \_\_\_\_\_?

- a) In ancient times, during the Greek philosopher's era
- b) In the 18th century
- c) In the early 1830s
- d) After the discovery of DNA in the 20th century

Q41. How do amoebae primarily move?

- a) By long, whip like flagellae
- b) Using rows of cilia
- c) By means of pseudopodia
- d) Through synchronized wavelike motion of cilia

Q42. Which subdivision of the Phylum Protozoa lacks specialized organelles for motility?

- a) Sarcodina
- b) Mastigophora
- c) Ciliata
- d) Sporozoa

Q43. How are most protozoal infections transmitted among humans?

- a) Through the inhalation of contaminated air
- b) Via insect bites and stings
- c) Through sexual transmission
- d) Mainly through the fecal-oral route and fecally contaminated food or water

Q44. Where can free-living protozoal species be found in the environment?

- a) In the atmosphere
- b) In deep underground soil
- c) In marine and freshwater habitats
- d) Only in human intestines

Q45. Through which route can parasites enter the human body?

- a) Mouth
- b) Skin
- c) Respiratory tract
- d) All of the above

Q46. Which species of *Schistosoma* causes urinary schistosomiasis?

- a) *Schistosoma mansoni*
- b) *Schistosoma haematobium*
- c) *Schistosoma japonicum*
- d) *Schistosoma intercalatum*

Q47. The common name for lymphatic filariasis caused by *Wuchereria bancrofti* and *Brugia malayi*?

- a) Elephantiasis
- b) Malaria
- c) Dengue
- d) Typhoid

Q48. Which of the following is a potential mode of transmission for *Entamoeba gingivalis*?

- a) Airborne transmission
- b) Vector-borne transmission
- c) Contact with fomites and kissing
- d) Sexual transmission

Q49. The form of *Balantidium coli* that is infective, and which part of the body does it reside?

- a) Trophozoite, in the lumen of the small intestine
- b) Cyst, in the lumen of the large intestine
- c) Trophozoite, in the submucosa of the large intestine
- d) Cyst, in the lumen of the small intestine

Q50. What clinical manifestation is commonly associated with onchocerciasis?

- a) Elephantiasis of the external genitalia
- b) Skin fibrous nodules (onchocercomata)
- c) Corneal opacity and optic atrophy
- d) Skin hypo- or hyper-pigmentation with dermatitis

**SECTION 2 (SHORT ANSWER QUESTIONS) (30 MARKS)**

- Q1. State the general characteristics of genus *Klebsiella* (6mks)
- Q2. Describe the pathogenesis of shigellosis (6mks)
- Q3. State the characteristics of an ideal Disinfectant (6mks)
- Q4. Describe the two forms of fungi (6mks)
- Q5. Describe the pathology of *Trichomonas vaginalis* infection (6mks)
- Atleast shpuld include students describing life cycles of common parasites

**SECTION 3 (LONG ANSWER QUESTIONS) (20 MARKS)**

- Q1. Discuss the ways by which viral infections can be prevented and or controlled (20mks)
- Q2. Elucidate the life cycle and pathogenicity of Guinea worm (20mks)