

NURU 127

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SPECIAL/RESIT

**FIRST YEAR EXAMINATION FOR THE AWARD OF
BACHELOR OF SCIENCE (NURSING)**

NURU 127: MEDICAL MICROBIOLOGY II

STREAMS: BSc Nursing (Y1T3)

TIME: 2 HOURS

DAY/DATE: THURSDAY 12/08/2021

8.30 A.M. – 10.30 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**

SECTION A (30 marks)

1. Which one of the following statements best characterizes Cytomegalovirus (CMV)?
 - a. It can be transmitted across the placental barrier
 - b. While a common infection, CMV is almost always symptomatic
 - c. The CMV can be cultured from red blood cells of infected patients
 - d. Unlike other viral infections, CMV is not activated by immunosuppressive therapy

2. Human rotaviruses are characterized by which of the following statements?
 - a. They have been implicated as a major etiologic agent of infantile respiratory disease
 - b. They produce cytopathic effects in many conventional tissue culture systems
 - c. They are lipid-containing RNA viruses possessing a double-shelled capsid
 - d. They can be sensitively and rapidly detected in stools by the enzyme-linked immunosorbent assay (ELISA) technique

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3. Paramyxoviruses are most commonly associated with which of the following diseases?
 - a. Otitis media
 - b. Rubella
 - c. Croup
 - d. Tonsillitis
4. Human papillomavirus is most commonly associated with
 - a. a. Rectal polyps
 - b. b. Prostate cancer
 - c. c. Condyloma acuminatum
 - d. d. Hepatic carcinoma
5. Reverse transcriptase is an enzyme unique to the retroviruses. Which one of the following is a function of the enzyme reverse transcriptase?
 - a. DNase activity
 - b. RNA-dependent RNA polymerase activity
 - c. RNA isomerase activity
 - d. RNA-dependent DNA polymerase activity
6. Which of the following best describes an infection with *Coccidioides immitis*?
 - a. A negative complement-fixing (CF) antibody test
 - b. Inhaled arthrospores form thick-walled spherules filled with endospores
 - c. "Fungus ball" formation
 - d. Thrush
7. If a virus is enveloped it is more easily inactivated by lipid solvents and detergents as compared to viruses that do not have an envelope. Which of the following viruses is the most sensitive to inactivation by lipid solvents and detergents?
 - a. Coxsackie virus
 - b. Hepatitis A virus
 - c. Herpes simplex virus
 - d. Rotavirus
8. Adults who have had varicella as children occasionally suffer a recurrent form of the disease, shingles. The agent causing these diseases is a member of which of the following viral families?
 - a. Herpesvirus
 - b. Adenovirus
 - c. Myxovirus
 - d. Paramyxovirus
9. Which of the following viruses that causes human disease has an animal reservoir?
 - a. Yellow fever virus
 - b. Small pox virus
 - c. Hepatitis C virus
 - d. Cytomegalovirus

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10. Regarding varicella-zoster virus (VZV), which of the following is most accurate?
- High-dose acyclovir can eliminate the latent state caused by VZV
 - When VZV infection occurs in immunocompromised patient acyclovir should be given to prevent disseminated infection
 - The principal site of latency of VZV is the nucleus of motor neurons
 - VZV is transmitted by dog-bite
11. Regarding parvovirus B19, which one is the most accurate?
- A vaccine that contains the killed virus as the immunogen is available
 - Parvoviruses have double-stranded DNA genome and require DNA polymerase for replication
 - Parvovirus B19 causes severe anemia because it preferentially infects erythrocyte precursors
 - Patients infected with parvovirus B19 can be diagnosed in the laboratory using cold agglutinin test
12. Each of the following statements concerning mucormycosis is correct EXCEPT:
- The causal fungi is transmitted by airborne asexual spores
 - Tissue sections from a patient with mucormycosis show budding yeast
 - Hyphae typically invade blood vessels and cause tissue necrosis
 - Diabetic ketoacidosis is a predisposing factor to the infection
13. Infection by a dermatophyte is MOST often associated with
- Intravenous drug abuse
 - Inhalation of organism from contaminated bird droppings
 - Adherence of organism to perspiration-moist skin
 - Fecal oral transmission
14. Aspergillosis is recognized in tissue by the presence of:
- Budding cells
 - Septate hyphae
 - Metachromatic granules
 - Pseudohyphae
15. Fungal cells that reproduce by budding are seen in the infected tissues of patients with:
- Sporotrichosis, candidiasis, and cryptococcosis
 - Mucormycosis, mycetoma, and candidiasis
 - Tinea versicolor, tinea corporis, and tinea unguium
 - Sporotrichosis, aspergillosis, and mycetoma

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16. Each of the following clinical syndromes is associated with infection by picornaviruses EXCEPT:
- Myocarditis
 - Hepatitis
 - Mononucleosis
 - Meningitis
17. Each of the following statements is correct EXCEPT
- Mumps virus is a paramyxovirus hence single stranded RNA genome
 - Meningitis is a recognized complication of mumps
 - Mumps orchitis in children before puberty causes sterility
 - During mumps the virus spread through bloodstream to various internal organs
18. Which of the following is the MOST reasonable explanation for the ability of hepatitis B virus to cause chronic infection?
- Infection does not elicit the production of antibody
 - The liver is “immunologically sheltered” site
 - Viral DNA can persist within the host cell
 - Many humans are immunologically tolerant to HBs antigen
19. A 74-year-old woman with chronic lymphocytic leukemia develops progressive deterioration of mental and neuromuscular function. At autopsy the brain shows enlarged oligodendrocytes whose nuclei contain naked icosahedral particles. The most likely diagnosis is:
- Herpes encephalitis
 - Rabies
 - Subacute sclerosing panencephalitis
 - Progressive multifocal leukoencephalopathy
20. Which of the following statements about genital herpes is LEAST accurate?
- Acyclovir reduces the number of recurrent disease episodes
 - Genital herpes can be transmitted in the absence of apparent lesions
 - Multinucleated giant cells with inclusions are found in the lesions
 - Initial disease episodes are generally more severe than recurrent episodes
21. Each of the following statements about human immunodeficiency virus (HIV) is correct EXCEPT:
- Screening tests for antibodies are useful to prevent transmission of HIV through blood transfusion
 - The opportunistic infections seen in AIDS are primarily due to loss of cell-mediated immunity
 - Zidovudine inhibits the RNA-dependent DNA polymerase
 - The presence of circulating antibodies that neutralize HIV is evidence that one is protected against HIV-induced disease

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22. Which of the following is the MOST common lower respiratory pathogen in infants?
- Respiratory syncytial virus
 - Adenovirus
 - Rhinovirus
 - Coxsackie virus
23. Which of the following statements about prevention of viral disease is CORRECT?
- Adenovirus vaccine contains purified penton fibers and is usually given to children in conjunction with polio vaccine
 - Coxsackie virus vaccine contains live virus that induces IgA, which prevents infection by homologous serotypes
 - Flavivirus immunization consists of hyperimmune serum plus vaccine consisting of subunits containing the surface glycoproteins
 - One of the influenza virus vaccines contains killed virus that induces neutralizing antibody directed against hemagglutination
24. Which of the following statements is CORRECT about poliovirus?
- Congenital infection of the fetus is an important complication
 - The virus replicates extensively within the gastrointestinal tract
 - A skin test is used to determine prior exposure
 - Amantadine is an effective preventive drug
25. Regarding human papilloma virus (HPV) which is the most accurate?
- There is no vaccine available against HPV
 - Acyclovir is effective in preventing lesions caused by HPV but does not cure the latent state
 - Antigen-antibody complexes play an important role in the pathogenesis of warts caused by HPV
 - The early proteins of HPV play a more important role in malignant transformation than the late proteins
26. Regarding measles virus and the disease measles, which one of the following statements is most accurate?
- The measles vaccine contains the killed virus as the immunogen
 - One of the main sequelae of measles is autoimmune glomerulonephritis and kidney failure
 - Fecal-oral transmission during the diaper stage is the main mode of acquisition of measles virus
 - The virus has only one antigenic type and lifelong immunity occurs when one gets infected

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27. Which of the following statements is most accurate regarding rotavirus?
- Rotavirus is a major cause of nosocomial diarrhea in intensive care units
 - The vaccine against rotavirus contains live attenuated virus as the immunogen
 - Rotavirus has a non-segmented, single stranded RNA genome and there is no polymerase in the virion
 - Diarrhea caused by rotavirus is due to a viral protein that increases the release of IgA from many submucosal B lymphocytes
28. An outbreak of jaundice occurs in several children who attend the same day care centre. If the outbreak was caused by a virus, which of the following is the most likely cause?
- Hepatitis A
 - Hepatitis B
 - Hepatitis C
 - Hepatitis D
29. *C. albicans* is recognized in microscopic examination of infected tissues by the presence of
- Spherules containing endospores
 - Metachromatic granules
 - Yeasts and pseudohyphae
 - Abundance of septate rhizoids
30. *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?
- Yeasts with broad-based bud
 - Single-cell yeasts with pseudohyphae
 - Arthrospores
 - Oval budding yeasts inside macrophages

SECTION B (30 MARKS)

- Describe the characteristics of the measles virus (5 marks)
- With examples, state the five (5) categories of mycosis of medical importance (5 marks)
- State five (5) functions of viral proteins (5 marks)
- Describe the pathogenesis of *cryptococcal* infection (5 marks)
- Describe the pathogenesis of Human Papilla Virus (5 marks)
- Describe the HIV replication cycle (5 marks)

SECTION C (40 MARKS)

- There are various ways of classifying viruses. With examples, describe the classification of viruses on the basis of their genome and capsid (20 marks)
- Describe cutaneous mycoses under:
 - Main genera (9 marks)
 - Types (6 marks)
 - Prevention and control (5 marks)