



UNIVERSITY OF JAFFNA, SRI LANKA
SECOND EXAMINATION FOR MEDICAL DEGREES PART (I)

February 2025

Academic Year 2020/2021

Microbiology - Paper I

Date: 11.02.2025

Answer all 30 questions

1.30 pm to 3.00 pm. (1½ hours)

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1. Cell wall
 - a) structure difference is the basis for the Gram staining properties of bacteria
 - b) of Gram positive bacteria consists of endotoxin
 - c) structure of Gram negative bacteria is responsible for the intrinsic resistance of these bacteria to vancomycin
 - d) of bacteria is the main target site for aminoglycosides
 - e) is not found in *Mycoplasma pneumoniae*
 2. Droplet transmission-based precautions
 - a) should be followed for all patients in the healthcare settings irrespective of their infective status
 - b) are necessary for patients with meningococcal meningitis
 - c) include isolating the patient in a negative pressure room
 - d) should be followed for varicella pneumonitis patients managed in the wards
 - e) include wearing a surgical mask when attending the patient
 3. Person to person transmission of infection occurs in
 - a) tetanus
 - b) Madura foot
 - c) botulism
 - d) legionellosis
 - e) scrub typhus
 4. Cytotoxic T- cells
 - a) kill virus infected cells
 - b) are phagocytes
 - c) neutralize exotoxins produced by bacteria
 - d) play a major role in the innate immune response
 - e) do not produce memory cells
 5. Vaccines that cannot be given in pregnancy include
 - a) tetanus toxoid
 - b) anti-rabies vaccine
 - c) MMR vaccine
 - d) COVID-19 vaccine
 - e) Hepatitis B vaccine

6. Meropenem
 - a) is the first choice antibiotic for the treatment of healthcare associated sepsis
 - b) covers *Acinetobacter* spp.
 - c) can be used in the treatment of infection with methicillin resistant *Staphylococcus aureus* (MRSA)
 - d) covers *Pseudomonas aeruginosa*
 - e) is the first choice antibiotic in the treatment of severe typhoid fever
7. Penicillin G
 - a) has good oral bioavailability
 - b) can be used in the treatment of infections with *Bacteroides fragilis*
 - c) can be used in the empirical treatment of gonorrhoea
 - d) is contraindicated in pregnancy
 - e) can be used in the treatment of *Mycoplasma pneumoniae* pneumonia
8. Antibiotics used for the treatment of anaerobic infections include
 - a) clindamycin
 - b) gentamicin
 - c) ceftriaxone
 - d) azithromycin
 - e) metronidazole
9. A 20-year-old otherwise healthy man presented with non-itchy rashes on the face, neck and upper trunk. On examination, multiple, discrete and coalescing, hypopigmented patches were seen on those areas. State whether the following are true or false regarding this infection.
 - a) The causative agent can be *Epidermophyton* spp.
 - b) This infection occurs in the deep dermis and subcutaneous tissue.
 - c) The diagnosis is made mostly clinically.
 - d) The causative organism can be cultured in routine clinical microbiology laboratories.
 - e) This infection can be treated with topical fusidic acid.
10. Fluconazole
 - a) has good oral bioavailability
 - b) is nephrotoxic
 - c) is the first choice antimicrobial for the treatment of resistant candidiasis
 - d) covers *Cryptococcus neoformans*
 - e) can be used in the treatment of pneumocystosis
11. State whether the following are true or false regarding *Staphylococcus aureus* infections.
 - a) Impetigo occurs in the epidermis.
 - b) Scalded skin syndrome is caused by exfoliatin toxin.
 - c) Staphylococcal food poisoning more commonly presents with nausea and vomiting than with diarrhoea.
 - d) Panton-Valentine Leukocidin (PVL) positive *Staphylococcus aureus* causes recurrent skin and soft tissue infections.
 - e) Coalescence of several inflamed follicles into an inflammatory mass with purulent drainage from multiple sinuses is known as a furuncle.

12. Stool culture report of a seven-year-old child revealed growth of nontyphoidal *Salmonella* spp. Common ways by which this child could have acquired this infection include
- a) from endogenous gut flora
 - b) eating undercooked meat
 - c) drinking unpasteurized milk
 - d) eating undercooked eggs
 - e) drinking contaminated water
13. *Clostridioides difficile*
- a) is a spore forming organism
 - b) infection is precipitated by third generation cephalosporins
 - c) is an important cause of diarrhoea in children
 - d) infection can be confirmed by toxin test on stool specimens of patients
 - e) infected patient management should include contact transmission precautions
14. Respiratory syncytial virus (RSV)
- a) can survive on inanimate surfaces for hours
 - b) can be transmitted by droplet transmission
 - c) can cause common cold syndrome in older children and adults
 - d) is an important cause of bronchiolitis
 - e) specific IgM test is useful in the diagnosis of infections by RSV
15. Human infection with avian influenza virus
- a) is commonly acquired from symptomatic patients
 - b) has a high mortality rate
 - c) can be confirmed by RT-PCR
 - d) is treated with oseltamivir
 - e) can be prevented by seasonal influenza vaccine
16. Hand, foot and mouth disease
- a) is a zoonotic infection
 - b) commonly occurs in elderly
 - c) is commonly caused by Coxsackie A virus
 - d) can be transmitted by indirect contact through contaminated surfaces and objects
 - e) infection can be prevented by vaccination
17. A 57-year-old man was admitted with generalized spasms, muscle stiffness and locked jaw for three days. He was alert and had deep exaggerated reflexes. His daughter said that the patient had a nail prick injury ten days ago. State whether the following are true or false regarding the infection this patient has got.
- a) The causative organism is an anaerobe.
 - b) Diagnosis is confirmed routinely by culturing the causative organism.
 - c) Specific immunoglobulin should be administered early in the management.
 - d) Vaccine against this infection should be given to this patient as part of the management.
 - e) Penicillin is the antibiotic of choice.

18. A six-year-old child presented with a history of throat pain, difficulty in swallowing and fever for two days. The child did not have cough, runny nose or conjunctival suffusion. Her temperature was 38.9°C. Her tonsils were enlarged with exudate and she had enlarged tender anterior cervical lymph nodes. State whether the following are true or false regarding this infection.

- a) The most probable diagnosis is streptococcal pharyngitis.
- b) ASOT can be used for the aetiological diagnosis of this infection in this patient.
- c) Resistance is a major problem in the antimicrobial treatment of this infection.
- d) Scarlet fever should be suspected if this child develops generalised maculopapular rash.
- e) Antimicrobial treatment of this child prevents the development of renal complications.

19. A 40-year-old splenectomised man was admitted with a history of fever, chills and productive cough with purulent sputum for two days. He developed dyspnoea on the day of admission. His temperature was 39.5°C, respiratory rate 20 per minute and coarse crepitations were heard over the right mid zone of the lungs.

Gram staining of his blood sent for automated blood culturing revealed Gram positive diplococci. State whether the following are true or false regarding this infection.

- a) The most probable diagnosis is acute bronchitis.
- b) The causative organism of this infection is *Streptococcus pneumoniae*.
- c) The first choice antibiotic for the targeted treatment of this infection is azithromycin.
- d) This patient's management in the ward should include droplet transmission precautions.
- e) Closed contacts of this patient should have been given ciprofloxacin as chemoprophylaxis.

20. A 61-year-old lady presented with dysuria, frequency of micturition and haematuria for three days. She did not have any other significant complaints. She was treated for cystitis twice within the last six months with different antibiotics. She was started on empirical nitrofurantoin after collecting urine for culture.

Her urine culture report revealed pure growth of coliform more than 10^5 CFU/ml. Part of the antibiotic sensitivity pattern is given below.

Cephalexin – R
Cefuroxime – R
Ceftriaxone – R
Gentamicin – S
Co-amoxiclav – R
Ciprofloxacin – R
Nitrofurantoin – S

State whether the following are true or false regarding this infection.

- a) Altered periurethral flora due to hormonal change is a risk factor for cystitis in this patient.
- b) The bacteria isolated can be an ESBL producer.
- c) Blood culture should be done in this patient.
- d) She should be switched to gentamicin.
- e) Empirical antibiotic should not have been given to this patient.

21. State whether the following are true or false regarding dengue.
- a) Dengue haemorrhagic fever (DHF) is caused by a specific serotype of the dengue virus.
 - b) Haemorrhagic manifestations are the defining characteristics of dengue haemorrhagic fever (DHF).
 - c) A reduction in platelet count can be detected as early as the first day of fever.
 - d) The detection of anti-DENV IgG is useful in diagnosing secondary dengue infections.
 - e) Antibody-dependent enhancement (ADE) occurs in secondary dengue infections.
22. Herpes simplex virus 1 (HSV-1)
- a) establishes latent infection in the trigeminal ganglion
 - b) infections are mainly transmitted via droplet transmission
 - c) reactivation occurs only after the age of 50 years
 - d) is a common cause of viral encephalitis in adults
 - e) can be diagnosed using Tzanck smear
23. *Candida albicans*
- a) can be found as normal flora of the mouth.
 - b) is the most common pathogenic *Candida* species
 - c) infections occur only in immunocompromised hosts
 - d) can cause endophthalmitis
 - e) is best treated with griseofulvin
24. State whether the following are true or false regarding leprosy.
- a) Tuberculoid leprosy is associated with strong humoral immunity.
 - b) It can be transmitted through shaking hands with infected individuals.
 - c) It has been eradicated in Sri Lanka.
 - d) Lepromatous leprosy can be confirmed by the lepromin skin test.
 - e) It can be effectively prevented with BCG vaccination.
25. State whether the following are true or false regarding hepatitis viruses.
- a) Hepatitis E virus (HEV) can be transmitted from animal reservoirs.
 - b) Infectivity of hepatitis B virus (HBV) is best assessed by detecting HBcAb in the serum.
 - c) Hepatitis C virus (HCV) is characterized by genetic variability and multiple genotypes.
 - d) Hepatitis D virus (HDV) can cause superinfection in individuals already infected with hepatitis B virus (HBV).
 - e) Asymptomatic chronic carriage of hepatitis A virus (HAV) is commonly observed in individuals infected with HAV.
26. Complications caused by mumps include
- a) congenital abnormalities in the heart
 - b) meningoencephalitis
 - c) deafness
 - d) blindness
 - e) orchitis

27. Parvovirus B19

- a) causes erythema infectiosum in children
- b) can cause severe aplastic anemia in patients with thalassemia
- c) can cause polyarthropathy in women
- d) produces an erythematous rash that is infectious
- e) infections can be prevented by killed vaccines

28. Shigellosis

- a) can be transmitted from infected poultry
- b) commonly leads to systemic infection
- c) may lead to hemolytic uremic syndrome (HUS)
- d) can be confirmed by stool culture.
- e) severe cases can be treated with ciprofloxacin

29. A 32-year-old man presents with painless, firm, clean ulcers on his penis. He says he had unprotected sexual intercourse with a new partner one month ago. Clinical examination reveals non-tender inguinal lymph node enlargement. State whether the following are true or false regarding this infection.

- a) The most probable diagnosis is chancroid.
- b) The ulcers are caused by a virus.
- c) Darkfield microscopy can be used in the diagnosis.
- d) If untreated, the condition can progress to systemic infection.
- e) Tetracycline is the first-line treatment.

30. Histoplasmosis

- a) is present in Sri Lanka
 - b) is caused by a dimorphic fungus
 - c) can cause chronic lung disease
 - d) can be confirmed using the histoplasmin skin test
 - e) disseminated infections can be treated with amphotericin B
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