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**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO**

**POSTGRADUATE DIPLOMA IN MEDICAL MICROBIOLOGY**  
**EXAMINATION – DECEMBER 2018**

**Date:-** 14<sup>th</sup> December 2018

**Time :-** 9.00 a.m. – 12.00 noon

**STRUCTURED ESSAY PAPER**

Answer **all six (06)** questions.

Answer each question in a separate book.

Write the index number in each answer book.

1. Virulence is the measure of pathogenicity of a microorganism. Virulence factors help bacteria to cause disease in humans.
  - 1.1. Describe five (05) types of virulence factors in bacteria. (30 marks)
  - 1.2. State two (02) bacterial species for each of the virulence factors described in 1.1. (30 marks)
  - 1.3. List three (03) determinants in the expression of bacterial virulence factors. (20 marks)
  - 1.4. Mention two (02) instances where the knowledge on virulence factors is utilized in the prevention of bacterial infections. (20 marks)
2. *Neisseria meningitidis* is the aetiological agent of meningococcal disease, most commonly meningococcal meningitis.
  - 2.1. Describe the laboratory methods used in the detection of *Neisseria meningitidis* from a sample of CSF. (50 marks)
  - 2.2. What are the methods available for antibiotic susceptibility testing of this organism and the antibiotics recommended for testing?(20 marks)
  - 2.3. Outline the importance of *Neisseria meningitidis* serogrouping. (10 marks)
  - 2.4. Describe briefly the prevention of meningococcal disease. (20 marks)

3. Several infants were admitted to a hospital with high fever, cough and cold over a period of two weeks. Most had bilateral crepitations on auscultation with radiological features of pneumonia. Some were admitted to intensive care unit and a few infants died of respiratory failure.
  - 3.1. List five (05) viral aetiological agents that could cause above outbreak. (10 marks)
  - 3.2. What information would you obtain to investigate this outbreak? (10 marks)
  - 3.3. Briefly describe the samples you would send to the Medical Research Institute (MRI) to confirm viral aetiology. (40 marks)
  - 3.4. Outline the investigations that can be performed at MRI and overseas Regional Respiratory Reference Laboratories. (15 marks)
  - 3.5. Outline the measures necessary to control this outbreak. (25 marks)
4. Briefly describe;
  - 4.1. how the classical complement pathway is activated. (25 marks)
  - 4.2. how the complement system protects against infectious diseases. (25 marks)
  - 4.3. the clinical features of complement deficiency. (25 marks)
  - 4.4. how the complement system protects against immune complex disease. (25 marks)
5. State the clinical diagnosis, list the aetiological agent/s and briefly describe the laboratory diagnosis and interpretation of the results in the following case scenarios.
  - 5.1. A 7-year-old child having three pet cats presented to a medical clinic with mild intermittent fever and cervical lymphadenopathy. A parasitological diagnosis is suspected. (30 marks)
  - 5.2. A 3-year-old child with a history of passing fleshy whitish moving segments in his faeces for a period of three months. (35 marks)
  - 5.3. A 24-year-old female teacher presenting with a history of oedema and redness over the right ankle. She had right inguinal lymphadenopathy prior to the onset of above symptoms. (35 marks)

6. State the most likely clinical diagnosis and list the common fungal aetiological agent(s) for the following clinical scenarios. Describe the laboratory diagnosis including specimen collection and transport for each scenario.
- 6.1. A 40-year-old febrile neutropaenic patient in the intensive care unit was not responding to broad spectrum antibiotics for the past 2 weeks. He developed multiple, painful cutaneous lesions on both arms over the past three days. (40 marks)
  - 6.2. A 55-year-old farmer presented to the dermatology clinic with multiple, large, hyperkeratotic verrucous lesions clustered in the right foot. (30 marks)
  - 6.3. A 28-year-old female presented to the dermatology clinic with a brown coloured pigmented macular lesion on the left palm for two months duration. (30 marks)