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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

POSTGRADUATE DIPLOMA IN MEDICAL MICROBIOLOGY
EXAMINATION - DECEMBER 2017

Date: 7th December 2017

Time: 1.00 pm – 4.00 pm

STRUCTURED ESSAY PAPER

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

Answer each question in a separate book.

Write the index number in each answer book.

1.

1.1. On investigating an outbreak of pneumonia, it was revealed that all 22 patients were guests at a rest house having a central air conditioning system.

1.1.1. Name the most likely diagnosis and the causative bacterial pathogen. (10 marks)

1.1.2. Briefly describe the risk factors and mode of spread of this organism. (30 marks)

1.1.3. Name two (02) antibiotics of different classes used in the treatment of this infection. (10 marks)

1.2. A patient with a history of longstanding dental caries presented with Vincent's angina.

1.2.1. List three (03) organisms which contribute to dental caries. (05 marks)

1.2.2. List three (03) organisms which contribute to the pathogenesis of Vincent's angina. (10 marks)

1.2.3. Briefly describe the collection, transport and processing of the specimen for the causative organisms mentioned in 1.2.2. (25marks)

1.2.4. Name two (02) antibiotics used in the treatment of Vincent's angina. (10 marks)

2. Antimicrobial resistance has emerged as a major public-health concern over the past decade in the community.

2.1. Name three (03) bacterial species which have emerged as a major public health concern in the community. (15 marks)

2.2. Outline the mechanisms of antibiotic resistance in the three species you have mentioned in 2.1. (30 marks)

2.3. As a microbiology registrar describe how you would help to reduce the emergence and spread of antibiotic resistance in the bacterial species mentioned in 2.1. (45 marks)

2.4. State two (02) antimicrobial agents for infections caused by each of the organisms you have mentioned in 2.1. (10 marks)

3. A 35 year old male was admitted to emergency unit with acute onset of altered consciousness and convulsions. He has been febrile for the last 5 days with headache and vomiting. The patient had travelled to a rural agricultural location during rainy season where flooding irrigation is practiced in India prior to onset of symptoms.

3.1. What is your clinical diagnosis? (05 marks)

3.2. List two (02) most likely viral aetiological agents for his clinical presentation. (10 marks)

3.3. Describe the laboratory investigations to establish a viral diagnosis in this patient. (40 marks)

3.4. Briefly discuss the interpretation of the results of the investigations in 3.3. (20 marks)

3.5. Outline the measures available for prevention and control of one (01) of the viral causes that you listed in 3.2. (25 marks)

4.
 - 4.1. Outline how intracellular antigens are presented to **cytotoxic** T cells. (25 marks)
 - 4.2. Explain briefly how activated **T helper** cells eliminate intracellular pathogens such as *Mycobacterium tuberculosis*. (25 marks)
 - 4.3. Outline how the antibody response to bacteria
 - 4.3.1. results in tissue damage. (15 marks)
 - 4.3.2. is used in diagnosis. (15 marks)
 - 4.4. Explain, briefly, why patients with chronic granulomatous disease (CGD) are more prone to develop infections with *Staphylococcus aureus*. (20 marks)

5. State the most likely clinical diagnosis and list the common fungal aetiological agent(s) for each of the three clinical scenarios given below. Describe the laboratory diagnosis including specimen collection and transport for each condition.
 - 5.1. A 60 year old agricultural worker who complains of right sided ocular pain, diminished vision, tearing and discharge. On examination there is ocular redness, and the cornea has a noticeable haze. He remembered something getting into his eye during the harvesting season which he had brushed away at the time. (40 marks)
 - 5.2. A 30 year old male complains of left sided ear ache and discharge with impaired hearing, aural fullness and pruritus. (30 marks)
 - 5.3. A 50 year old obese diabetic female complains of soreness and itching of the groin and the intergluteal folds. On examination the lesions are macerated and erythematous with an irregular margin. (30 marks)

6. A 32 year old soldier presented to dermatology clinic with painless, non-itchy ulcer on his face of three (03) months duration.
 - 6.1. What is the most likely parasitic cause for this condition? (10 marks)
 - 6.2. What is the mode of transmission? (10 marks)
 - 6.3. Briefly describe the investigations you would request to establish the diagnosis. Include type of specimens, test methods, interpretation of expected results in your answer. (50 marks)
 - 6.4. Discuss the options available for treatment. (30 marks)