

# Question Paper

Exam Date & Time: 06-01-2022 (10:20 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION SECOND MBBS DEGREE (CBME) EXAMINATION – JANUARY 2022 SUBJECT: MICROBIOLOGY - PAPER I

Marks: 80

Duration: 160 mins.

**All questions are compulsory.**

**Illustrate your answers with diagrams flowcharts, tables, etc., wherever necessary.**

1. In the post-operative ward of Orthopaedic department of a tertiary care centre, it was observed that many patients developed surgical site infection by Methicillin resistant Staphylococcus aureus. On reviewing the situation, it was found that all infected patients were operated on the same day. Further scrutiny of situation highlighted that there was a problem with sterilization of all the surgical instruments and gowns on that particular day.
  - 1A) What is the sterilization technique used for all surgical instruments and surgical gowns? (1)
  - 1B) What is its principle? (2)
  - 1C) What are the precautions needed for this technique? (3)
  - 1D) How to assure the quality of sterilization technique? (4)
  
2. A 26-year-old man presented to OPD with breathlessness and wheezing. He gave the history of having been stung by honey bees half an hour earlier, while collecting wood from forest. Physical examination showed presence of maculopopular, itchy, erythematous rash and severe dyspnea.
  - 2A) What is the most probable clinical condition described above? (1)
  - 2B) What is the mechanism of this manifestation? (5)
  - 2C) What are the diagnostic tests for it? (4)
  
3. **Write short notes on:**
  - 3A) List structural differences between cell wall of Gram-positive and Gram-negative bacteria and their importance. (4)
  - 3B) Discuss various stages of bacterial growth and their importance. (4)
  - 3C) List methods of viral cultivation with examples. (4)
  - 3D) Write mechanisms of autoimmunity. (4)
  - 3E) Enumerate 4 biological functions of complements. (4)
  - 3F) Laboratory diagnosis of Leishmaniasis. (4)
  - 3G) Pathogenesis and laboratory diagnosis of Rheumatic fever. (4)
  - 3H) List parasites causing anemia and the reason of anemia for each. (4)
  - 3I) List parasites causing anemia and the reason of anemia for each. (4)

- 3J) Show with a flow-chart a plan to diagnose a case of pneumonia. (4)
- 3K) Describe Vincent's angina - Definition, Etiology and Lab diagnosis. (4)
- 3L) Importance of atypical mycobacteria. (4)
- 3M) Write the etiology, source, transmission and one microbiological test for Legionnaire's disease. (4)
- 3N) Detail the different measures needed to control the spread of air-borne infections in healthcare settings. (4)
- 3O) Enumerate the various opportunistic infections in a HIV case in relation to the CD4 count. (4)  
Summarize the various measures practiced if a health care worker gets needle stick injury while drawing blood of HIV infected patient.(4)

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# Question Paper

Exam Date & Time: 07-01-2022 (10:20 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION SECOND MBBS DEGREE (CBME) EXAMINATION – JANUARY 2022 SUBJECT: MICROBIOLOGY - PAPER II

Marks: 80

Duration: 160 mins

- 1) A 28-year-old female just returned from a 1-week trip in India. Forty-eight hours after her return she reported to have headache, fever, abdominal cramps, and constipation. Over the next 5 days, her fever increases with continued complaints of myalgia, malaise, and anorexia. A blood culture revealed non lactose fermenting colonies on Mac Conkey agar. The gram negative bacilli was oxidase negative. Answer the following questions related to the case discussed.
- 1A) What could be the most probable diagnosis and the causative agent in the given case. (2)
- 1B) Pathogenesis, clinical features of this condition. (4)
- 1C) Describe the specimen collection and laboratory diagnosis of the above case. (4)
- 2) A 4 year old child presents with neck rigidity and vomiting. CSF was collected and plated on a chocolate agar with X & V factors. After 18 hours of incubation, the agar grows Gram-negative bacilli that are oxidase positive. What is your diagnosis and probable etiological agent? Describe the pathogenesis of this disease. Add a note on prophylaxis available in this case. (2+5+3 = 10 marks)
3. **Short answer questions:**
- 3A) A 60-year-old shepherd presents with pain abdomen. O/E he had hepatomegaly. Ultra sound reveals a large cyst mass in the liver. The liver cyst aspiration reveals "hydatid sand." Which is the most likely agent involved and the pathogenesis in formation of this hydatid sand? (1+3 = 4 marks)
- 3B) Enumerate any four etiological agents causing viral diarrhea. (4)
- 3C) A 30-year-old man drank stream water and later experienced abdominal cramps with foul-smelling and greasy stool. What is the infective stage of the organism and the diagnosis? Write the laboratory work up required in this case. (1+3 = 4 marks)
- 3D) Discuss the virulence factors and pathogenesis of Group-A Streptococci in relation to skin & soft tissue Infections. (4)
- 3E) A farmer sustained an injury when a stick pierced his leg. A few days later he noticed spasm in the leg muscles, which progressed to become generalized and involved the jaws. In the hospital casualty, when the door slammed, on hearing this loud sound he developed arching of the back.
- i) What is the most probable diagnosis & the responsible etiological agent?
- ii) What are the various modes of transmission & discuss the mechanism of action of toxin in this disease:

(1+1+2 = 4 marks)

- 3F) Enumerate the infections and discuss the pathogenesis of skin lesions caused by Herpes simplex virus 1. (2+2 = 4 marks)
- 3G) Describe the lesions seen in a suspected case of Rhinosporidiosis and the methods used in its diagnosis. (2+2 = 4 marks)
- 3H) A 3 day-old neonate was brought to the pediatric emergency room with fever, irritability, poor feeding, and a bulging anterior fontanelle. Lumbar puncture is performed, and the cerebrospinal fluid gram stain reveals gram positive cocci in short chains. What is the clinical diagnosis and the etiological agent? Enumerate the other organisms causing such condition. What are the preventive measures that can be taken in this case? (1+2+1 = 4 marks)
- 3I) Discuss the serological tests and their interpretations in the secondary syphilis. (4)
- 3J) A 35-year-old woman presents with itching and burning pain of vagina. On examination, white discharge is apparent. On Sabourad's dextrose agar white creamy colonies are present. She also gives a history of consuming oral contraceptive pills. What is the probable condition? Explain the diagnostic workup in this case. (1+3 = 4 marks)
- 3K) A homosexual male presents to his doctor with bilateral inguinal buboes (lymph nodes), one of which seems ready to rupture. He recalls having two small, painless genital lesions that healed rapidly. The etiologic agent is isolated using McCoy cells. What is the clinical diagnosis? Discuss the clinical manifestations and complications seen in this case? (1+3 = 4 marks)
- 3L) A 28 year old female presented with signs of cystitis. Clean catch midstream urine sample was sent for evaluation. Briefly explain the laboratory work up in this case. (4)
- 3M) Discuss briefly the laboratory diagnosis & preventive measures in Anthrax. (4)
- 3N) A seven-year-old child was attacked by some stray dogs while playing on the street outside his house. On examination at casualty, multiple bite marks with gaping wound were noticed on the left forearm. What are the post exposure prophylaxis recommended for this case? (4)
- 3O) Describe in brief the pathogenesis of Leptospirosis. (4)

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