

Question Paper

Exam Date & Time: 29-Jan-2024 (10:20 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION
SECOND PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JANUARY/FEBRUARY 2024
SUBJECT: MICROBIOLOGY PAPER I
(CBME BATCH)

Marks: 80

Duration: 160 mins.

Answer ALL questions.

Draw neat labeled diagram wherever necessary.

- 1) Between 3rd- 15th of February 2021, 40 cases presented with vomiting, loose stools, abdominal pain, fever, and nausea at one of the primary health centers of rural Bengaluru, Karnataka. District health authorities arrived for further investigations. Upon analysis of stool samples, *Shigella sonnei* was identified. In the background of the overall health event, answer the following questions.
- 1A) What epidemiological pattern of the disease is observed in the above scenario? Name another infection that might follow the similar epidemiological pattern. (1)
- 1B) Name other four epidemiological patterns of infectious disease occurrence along with appropriate examples each. (2)
- 1C) Briefly explain the epidemiological determinants of disease causation in reference to the infectious agent. (5)
- 1D) Comment on the role of healthy carriers in disease transmission with appropriate example. (2)
- 2) A 39-year-old female patient gave a history of recurrent infections of mucosa, nails, and skin caused by *Candida albicans*. At the onset, when the patient was two years old, the fungal infection started on the face and nails and progressively diffused to other cutaneous and mucosal tissues. The patient received several courses of systemic antifungal therapy. However, recurrence of candidiasis occurred shortly after halting the therapy.
- 2A) What is your probable diagnosis? (1)
- 2B) What kind of immune response is impaired against above mentioned pathogen? Give examples of other pathogens where a similar type of immune response plays an important role. (2)
- 2C) Discuss the role of different types of T cells in the immune response elicited against these pathogens. (5)
- 2D) Differentiate between primary and secondary immune responses. (2)
- 3) **Write short notes on:**
- 3A) Illustrate the role of conjugation in bacterial drug resistance with examples. (4)
- 3B) Explain the principle of commonly used sterilizer for decontamination of biomedical waste in the microbiology laboratory. Add a note on Sterilisation controls used for this steriliser. (4)

- 3C) Explain Antigenic variations exhibited by Influenza A and Influenza B viruses and their significance. (4)
- 3D) Construct a laboratory diagnostic protocol for a suspected case of diphtheria. (4)
- 3E) Describe the role of *Paragonimus westermani* in lower respiratory tract infection. (4)
- 3F) Design a diagnostic algorithm for adult pulmonary tuberculosis. (4)
- 3G) Discuss the hypersensitivity mechanism involved in the tuberculous granuloma formation. (4)
- 3H) Distinguish between innate and acquired immunity. (4)
- 3I) Formulate an algorithm for diagnosis of HIV in a symptomatic individual according to NACO strategy. (4)
- 3J) Summarize the predisposing factors and the key laboratory findings of rhinocerebral zygomycosis. (4)
- 3K) Enumerate the nematodes causing microcytic hypochromic anemia and discuss the key laboratory findings. (4)
- 3L) Narrate the importance of peripheral blood smear examination in the diagnosis of malaria. (4)
- 3M) Brief on the predisposing factor and pathogenesis of acute rheumatic fever. (4)
- 3N) Propose the appropriate infection control measures to prevent central line associated blood stream infection. (4)
- 3O) Discuss the role of inclusion bodies in the diagnosis of viral diseases. (4)

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Question Paper

Exam Date & Time: 31-Jan-2024 (10:20 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION
SECOND PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JANUARY/FEBRUARY 2024
SUBJECT: MICROBIOLOGY PAPER II
(CBME BATCH)

Marks: 80

Duration: 160 mins.

Answer all the questions.

Essay questions:

- 1) A 50-year-old diabetic man presented with a painful abscess at the back of neck. Pus from the lesion showed gram positive cocci in clusters along with many polymorphonuclear leucocytes. Golden yellow beta-hemolytic colonies were grown on blood agar and the organism was positive for coagulase test.
- 1A) What is the etiological agent? (1)
1B) Describe the virulence factors produced by this organism (4)
1C) Enumerate the various clinical conditions caused by this organism (3)
1D) Describe antimicrobial resistance in this organism (2)
- 2) A 40-year-old man presented with loss of appetite, fatigue, nausea, vomiting and jaundice. He had received blood transfusion 3 months back. His liver function tests showed elevated serum bilirubin and liver enzymes. A viral hepatitis panel of tests was advised. The results showed HBsAg positive and IgM anti HBc positive.
- 2A) What is the most probable diagnosis? (1)
2B) Describe the pathogenesis of this viral infection (3)
2C) Explain the laboratory diagnosis (4)
2D) Describe the prevention of this infection (2)
- 3) **Write short notes on:**
- 3A) Explain the laboratory diagnosis of Cholera. (4)
3B) Describe the source, transmission and major manifestations of ancylostomiasis (4)
3C) Discuss the prophylaxis in typhoid fever (4)
3D) Plan laboratory diagnosis of dermatophytoses (4)
3E) List viruses causing exanthems. Explain the prevention of two viral exanthematous fevers. (4)
3F) What are the advantages and disadvantages of inactivated and live attenuated oral polio vaccines (4)
3G) Plan laboratory diagnosis of a suspected case of pyogenic meningitis in a 30-year-old male patient (4)
3H) Describe the pathogenesis of neurocysticercosis (4)

- 3I) A 50-year-old man complains of dysuria, urgency and frequency of micturition. He is afebrile and does not have loin pain. Discuss specimen collection and laboratory diagnosis of this case. (4)
- 3J) Describe the laboratory diagnosis of trichomoniasis (4)
- 3K) Plan the laboratory diagnosis in a suspected case of Gonorrhoea. (4)
- 3L) Name the causative agents and mention the differences between chancroid and primary chancre (4)
- 3M) Describe the role of virulence factors of *Bacillus anthracis* in the pathogenesis of anthrax (4)
- 3N) A 5-year-old boy was bitten by a street dog and he sustains multiple bite wounds with bleeding on chest, neck and cheeks. Regarding rabies, mention the category of exposure and describe the recommended prophylaxis. (4)
- 3O) Describe the different modes of human infections by *Toxoplasma gondii*. Name the parasitic stages found in humans and the common organs harboring them (4)

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