

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	<p>Case Study: A 45-year-old female patient presents with a breast lump. A biopsy specimen is collected and sent to the histopathology laboratory for diagnosis. The pathologist emphasizes that accurate diagnosis depends on proper processing of the tissue at every stage.</p> <p>Analyze the case and explain the complete histopathological workflow, highlighting:</p> <ol style="list-style-type: none"> Collection and fixation of tissue Tissue processing (dehydration, clearing, infiltration) Embedding and sectioning techniques Staining methods and their role in identifying cellular components <p>In your answer, correlate each step with its importance in preserving tissue morphology and enabling accurate diagnosis.</p>	III	[1.5 X 4 = 6]
Q2	Differentiate between MDR (Multidrug-Resistant), XDR (Extensively Drug-Resistant) and TDR (Totally Drug-Resistant) cases of Tuberculosis.	II	[2]
Q3	A 22-year-old female student returns to Assam after fieldwork in a malaria-endemic rural area. She presents with cyclical fever every 48 hours, headache, and fatigue. Laboratory tests reveal hemolytic anemia and thrombocytopenia. Peripheral blood smear shows enlarged RBCs with Schüffner's dots, suggestive of <i>Plasmodium vivax</i> . PCR confirms the species. She reports a family history of mild anemia, and genetic screening reveals heterozygous sickle cell trait. The patient is treated with chloroquine followed by primaquine. However, G6PD testing is recommended before primaquine therapy. The clinician must evaluate parasite biology, host genetic protection,	III	[1.5x4=6]

and drug mechanisms to optimize treatment and prevent relapse due to dormant liver stages.

Answer the question below briefly:

- a) Differentiate *Plasmodium vivax* from *Plasmodium falciparum* based on pathogenesis and laboratory findings.
- b) Assess the role of host genetic factors in malaria protection.
- c) Analyze the mechanism of action of chloroquine and primaquine in relation to the parasite life cycle.
- d) Propose a comprehensive management and prevention strategy for this patient.
- e) Explain how the *Plasmodium falciparum* causes local hypoxic condition

[1]

Q4

Answer the following questions.

- a) A patient with oral thrush is prescribed fluconazole. Explain the mechanism of action of this drug and justify its use in this condition.
- b) Differentiate between superficial, subcutaneous, systemic, and opportunistic mycoses.
- c) Compare the mechanisms of action of amphotericin B and echinocandins, and analyze their clinical applications.
- d) Analyze the social and economic impact of infectious diseases, in developing countries.
- e) What are the principles involved in selecting appropriate anti-infective therapy.

II

[2x5=10]