

U.G. 4th Semester Examination - 2022**Molecular Biology and Biotechnology****[HONOURS]****Skill Enhancement Course (SEC)****Course Code : MBBT-H-SEC-2-T-108****(Microbial Diagnosis in Health Clinics)**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $2 \times 5 = 10$
- a) Name the species of *Plasmodium* that causes Malaria.
 - b) Why determination of Minimal Inhibitory Concentration value is important?
 - c) How will you stain cells of *Mycobacterium tuberculosis*?
 - d) Name two anticoagulants used during blood sample collection.
 - e) What is serial dilution technique? Explain.
 - f) What are the causative agents of typhoid and dengue?

- g) Name two bacterial diseases in human. Mention their causative agents.
 - h) Give example of each Gram positive and Gram negative bacterium.
2. Answer any **two** questions: $5 \times 2 = 10$
- a) State the uses of Blood agar and Chocolate agar media. How can you identify lactose fermenting and lactose non-fermenting bacteria? What is the role of Malachite green in Lowenstein-Jensen media? $2+2+1=5$
 - b) Write the general working principle of a Rapid Detection kit used for viral diseases. How presence of parasitic organisms can be examined in blood sample? $3+2=5$
 - c) How efficacy of two antibiotics against a bacterium can be compared using disc diffusion method? How can bacteria resist effect of antibiotics? $3+2=5$
 - d) Write the working principle and steps to perform Gram staining. $3+2=5$
3. Answer any **two** questions: $10 \times 2 = 20$
- a) Discuss common types of ELISA techniques used in disease diagnosis. State the advantages of ELISA. How immune-fluorescence techniques help in disease detection? $6+1+3=10$

[Turn Over]

- b) Briefly describe PCR technique and its use in disease detection. Why RT-PCR is a more authentic than Rapid test kits? $4+4+2=10$
- c) What is nucleic acid probe? State use of nucleic acid probes in diagnostic methods. Discuss the advantages and disadvantages of nucleic acid based approach over conventional methods for detection of disease. What is Swine Flu? $2+2+4+2=10$
- d) What is agglutination reaction? What are the factors that affect agglutination? Discuss characteristics that define colony morphology of isolates. What precautionary measures should be taken during collection of clinical samples? $1+2+4+3=10$
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