

U.G. 4th Semester Examination - 2020
Molecular Biology and Biotechnology
[HONOURS]

[Microbial Diagnosis in Health Clinics]

Skill Enhancement Course (SEC)

Course Code : MBBT(H)/SEC-2-108-T

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) State the reason behind chocolate brown colour of Chocolate-agar medium. Name an organism, which is isolated using this specific medium.
 $1+1$
 - b) If you want to study the role of Human papillomavirus in oropharyngeal cancer, how will you collect the sample?
 - c) What is the window period in HIV infection?
 - d) How will you detect *Vibrio cholerae* infection?
 - e) Can we use Ziehl-Neelson staining for

identification of *Mycobacterium tuberculosis*?
Explain.

- f) Which antigen(s) is/are targeted during the detection of dengue virus using rapid detection kit?
 - g) How is immuno-fluorescence used in serological methods for detection of diseases?
 - h) What precautions need to be followed during transport and storage of stool specimen?
2. Answer any **two** of the following: $5 \times 2 = 10$
- a) Describe the procedure of collection of cerebrospinal fluid. Highlighting the different types of punctures done during the collection process.
 - b) Write the composition of Blood-agar medium. What are the roles of glycerol and egg albumin in Lowenstein-Jensen medium and crystal violet and bile salts in MacConkey-agar medium?
 $2+1\frac{1}{2}+1\frac{1}{2}$
 - c) Name two anti-coagulant used during the collection of blood sample. Mention the procedures followed during transport and storage of clinical samples? $2+3$

- d) Describe different morphologies of bacterial colony. What type of colonies will be formed by *Mycobacterium tuberculosis* in Lowenstein-Jensen medium and *E. Coli* in MacConkey-agar medium? 3+2

3. Answer any **two** of the following: 10×2=20

- a) Describe the effects of malarial parasite on different body systems during its life cycle within human host. How malaria can be diagnosed by Giemsa staining of blood sample? What information can be obtained by Gram staining of an infected urine sample? What is Candidiasis? Name the causative organism of Athlete's foot. 3+2+2+2+1
- b) What is Minimum Inhibitory Concentration (MIC) of an antibiotic? Describe the procedure of determination of MIC of an Antibiotic using serial dilution method. How does the antibiotic sensitivity of a pathogenic bacteria change over the course of time? Explain the process of determination of antibiotic resistance/sensitivity of bacteria using disc diffusion method. 1+3+2+4

- c) Write the principle and the procedure used for rapid detection of any **two** of the following diseases:

Typhoid, Dengue, Swine flu 5+5

- d) "PCR and rapid synthesis of nucleic acid probes revolutionized the diagnosis of various viral diseases". Explain with example. Discuss the role of 'ELISA' and 'Agglutination reaction' in detection of pathogenic infection. 5+5