'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2023

SEC P2-MICROBIOLOGY

Time Allotted: 2 Hours | Full Marks: 60

The figures in the margin indicate full marks.

The question paper contains SEC-3 & SEC-4. The Candidates are required to answer any *one* from the *two* papers. Candidates should mention it clearly on the Answer Book.

SEC-3: (MICROBIAL DIAGNOSIS IN HEALTH CLINICS)

1. Answer any ***four*** of the following: 3×4 = 12

   (a) State the composition of MacConkey Agar. What kind of organisms can grow on this type of media? 2+1

   (b) How to collect clinical samples from oral cavity and skin? Mention the precautions required. 2+1

   (c) Comment on any two viral diseases of human body. $1\frac{1}{2}+1\frac{1}{2}$

   (d) What is the importance of antibiotic sensitivity testing in bacteria? 3

   (e) Discuss the principle behind Ziehl-Neelson staining for tuberculosis. 3

   (f) Define probes. State its function. 1+2

2. Answer any ***four*** questions: 6×4 = 24

   (a) Write a note on storage of clinical samples. Briefly describe the colony characteristics of *Mycobacterium tuberculosis*. 3+3

   (b) Explain the process of preparation of nucleic acid probes. What is the principle of PCR? 3+3

   (c) Discuss the principle behind HIV Detection Kit. 6

   (d) How will you determine MIC of an antibiotic using serial double dilution method? 6

   (e) Name some important fungal diseases of human body, mentioning their causative agents. How is the clinical sample collected for these diseases? 4+2

   (f) Describe the preparation method of chocolate agar. Which pathogen can successfully grow on blood agar? 4+2

3. Answer any ***two*** of the following: 12×2 = 24

   (a) Discuss, in detail, the serological methods used for detection of pathogens. 12

   (b) Write down the working principle of swine flu detection kit. Describe the principle of immunofluorescence method. What precautions should be taken while collecting samples from CSF? 6+4+2

(c) Name some important protozoan diseases of human. How the clinical samples are collected for these diseases? Give details of the principle of typhoid detection kit. 6+6

(d) What is the importance of antibiotic sensitivity testing in bacteria? How will you determine MIC of an antibiotic by serial double dilution method? 6+6

SEC-4: (FOOD FERMENTATION TECHNIQUES)

1. Answer any ***four*** questions of the following: 3×4 = 12

(a) Define starter culture. Name a starter culture used in fermented fish. 2+1

(b) What is leavening of bread? What are an indications of abnormal fermentation of bread? 2+1

(c) Describe the process of cheddaring. 3

(d) What is butter milk? Why is it used? 3

(e) What are the origin and function of organism/enzyme used for ripening process of cheese? 3

(f) What are microbiological and chemical changes that take place during sauerkraut production? 3

2. Answer any ***four*** from the following: 6×4 = 24

(a) Discuss the role of LABs in making fermented foods. 6

(b) Define probiotic. What are the health benefits of consuming probiotics? Name three microorganism which are being used as probiotics. 1+2+3

(c) Enlist fermented products based on meat. What are the effects observed during fermentation of meat? 3+3

(d) What are two general method of salting used in preparation of fermented pickle? Give one example of fermented pickle. 5+1

(e) With the help of flowchart, describe the process of yoghurt production. 6

(f) Describe the process of preparation of vegetable based Fermented food item. 6

3. Answer any ***two*** from the following: 12×2 = 24

(a) What are fermented milk products? Name any two bacteria used in preparation of fermented milk. Give schematic representation of various step involved in cheese production. 2+2+8

(b) With the help of flowchart, briefly describe the production of idli and highlighting microbial and chemical changes. 6+6

(c) What is the difference between bakers' yeast and brewers' yeast? Discuss the role of yeasts in food fermentation and their probiotic potential. Name one traditional fermented food from West Bengal. 4+7+1

(d) Discuss the processes involved in the preparation of inoculum for milk-based fermented products. Elucidate the process of soy-sauce production. 6+6

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