

SH-II/MCB/201/C-3/(PR)/19

**B.Sc. 2nd Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**(Biochemistry)**

**Paper : SH/MCB/201/C-P3**

**Course ID : 22221**

**Time: 2 Hours 30 Minutes**

**Full Marks: 15**

*The figures in the margin indicate full marks.  
Candidates are required to give their answers in their own words  
as far as practicable.  
The questions are equal value.*

1. Prepare a standard curve for the supplied sample (A1/A2), using five known concentrations. Determine the concentration of unknown sample supplied to you (UA1/UA2). 10  
[Principle 3; Graph and Table 4; Result 3]
  2. Viva voce 3
  3. Laboratory Notebook 2
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SH-II/MCB/202/C-4/19

**B.Sc. 2nd Semester (Honours) Examination, 2019****MICROBIOLOGY****(Virology)****Paper : SH/MCB/202/C-4****Course ID : 22212****Time: 1 Hour 15 Minutes****Full Marks: 25**

*The figures in the margin indicate full marks.  
Candidates are required to give their answers in their own words  
as far as practicable.  
The questions are equal value.*

1. Answer *any five* questions from the following: 1×5=5
- (a) Mention the contribution of Martinus Beijerinck in the field of virology.
  - (b) Define proto-oncogenes.
  - (c) What is Eclipse phase?
  - (d) What do you mean by window period?
  - (e) What are virusoids?
  - (f) Name one single stranded and one double stranded RNA virus.
  - (g) What is PFU?
  - (h) What is pock test?
2. Answer *any two* questions from the following: 5×2=10
- (a) Discuss the general characteristics of interferon. Mention some functions of it. 3+2=5
  - (b) Write a short note on Viral vectors used in cloning of foreign genes. What is phage display? 3+2=5
  - (c) Write a short note on Different modes of viral transmission. 5
  - (d) Write short notes on the following: 2½+2½=5
    - (i) p<sup>53</sup> protein
    - (ii) Antiviral agents
3. Answer *any one* question from the following: 10×1=10
- (a) Diagrammatically describe the structure of a typical T-even bacteriophage. What are capsomeres? State the functions of viral matrix proteins. 6+2+2=10
  - (b) Give a brief outline on the structure, mode of transmission and replication of Hepatitis-B virus. What is viral budding? 2+2+4+2=10

SH-II/MCB/202/C-4(PR)/19

**B.Sc. 2nd Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**(Virology)**

**Paper : SH/MCB/202/C-P4**

**Course ID : 22222**

**Time: First Day 2 Hours**

**Full Marks: 15**

**Second Day 30 Minutes**

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

1. Isolate and enumerate bacteriophages from the supplied sewage sample (A) using double agar overlay technique. 5  
(Principle–1, Workout–1, Observation and Result–2, Comment–1)
  2. Identify the supplied specimen (B and C) using proper reasoning. 3  
(Identification–½, Characteristics–1)=(1½×2)=3
  3. Viva voce 3
  4. Laboratory Notebook 2
  5. Field Report 2
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*SH-II/MCB/201/C-3(PRI)/19*

**B.Sc. 2nd Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**(Biochemistry)**

**Paper : SH/MCB/201/C-P3**

**Course ID : 22221**

*Instruction to the Examiners*

For Q-1, supply a standard known stock solution of any known sample (sugar/protein/RNA/DNA) and one unknown concentration for each. Supply all the reagents and necessary equipments to students. Supply graph paper to all of the students.

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SH-II/MCB/202/C-4(PRI)/19

**B.Sc. 2nd Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**(Virology)**

**Paper : SH/MCB/202/C-P4**

**Course ID : 22222**

**Instruction to the Examiners**

1. For Question No. 1, sterile agar (soft and hard) media, sewage water sample (A), sterile petriplates, test tubes, pipettes and fresh broth culture of *E. Coli* should be provided to the candidates.
2. For Question No. 2, Examiners are requested to keep arrangements of at least two sets of electron micrographs.
3. Key to the materials should be submitted along with the answer scripts.

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**SH-IV/MCB-401/C-8/19**

**B.Sc. 4th Semester (Honours) Examination, 2019**

**MICROBIOLOGY**

**Paper : 401/C-8**

**(Microbial Genetics)**

**Course ID : 42211**

**Time: 1 Hour 15 minutes**

**Full Marks: 25**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer *any five* from the following: 1×5=5
  - (a) What are auxotrophic mutants?
  - (b) What is Hfr-strain?
  - (c) What is co-transformation?
  - (d) What do you mean by mutational hot-spot?
  - (e) What is episome?
  - (f) What is sexduction?
  - (g) What is plasmid incompatibility?
  - (h) What is Ames test?
  
2. Answer *any two* from the following: 5×2=10
  - (a) Describe schematically the process of chromosomal gene transfer in Hfr×F<sup>-</sup> conjugation. 5
  - (b) What is Ti-plasmid? Describe the structure and significance of Ti-plasmid. 1+2+2=5
  - (c) What are transposon? Define composite and non-composite transposon. 1+2+2=5
  - (d) Write a short note on curing of Plasmids. 5
  
3. Answer *any one* from the following: 10×1=10
  - (a) Schematically describe the generalized and restricted transduction. 5+5=10
  - (b) (i) Define the following types of mutation— Nonsense mutation; Missense mutation.  
(ii) Discuss the genetic basis of lytic versus lysogenic switch of lambda phage. (2+2)+6=10

**SH-IV/MCB-402/C-9/19**

**B.Sc. 4th Semester (Honours) Examination, 2019**

**MICROBIOLOGY**

**Paper : 402/C-9**

**(Environmental Microbiology)**

**Course ID : 42212**

**Time: 1 Hour 15 minutes**

**Full Marks: 25**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer *any five* of the following: 1×5=5
  - (a) What is diazotrophs?
  - (b) Name two methods of water purification.
  - (c) Expand PSM.
  - (d) Why does rhizospheric microorganisms are always greater in number?
  - (e) What do you mean by recalcitrant compound.
  - (f) Define BOD and COD.
  - (g) Name one bacteria involved in P cycle.
  - (h) Name one nematophagus fungus.
  
2. Answer *any two* of the following: 5×2=10
  - (a) Write the names of different types of solid wastes. Name at least two methods used for solid waste disposal. Discuss briefly about any one of them. 2+1+2=5
  - (b) Write a short note on MPN test. 5
  - (c) Briefly discuss about microbial degradation of hydrocarbon compounds. Mention two names of microorganisms involved in it. 4+1=5
  - (d) How do microorganisms contribute to the nutrition of ruminant animals. Name one methanogenic bacteria present in rumen of cow. 4+1=5
  
3. Answer *any one* of the following: 10×1=10
  - (a) Discuss briefly about trickling filter method of waste water treatment. Define eutrophication. (8+2)=10
  - (b) Write a note on: 2.5×4=10
    - (i) Mutualism
    - (ii) Parasitism
    - (iii) Extremophiles
    - (iv) Amensalism

**SH-IV/MCB-403/C-10/19**

**B.Sc. 4th Semester (Honours) Examination, 2019**

**MICROBIOLOGY**

**Paper : 403/C-10**

**(Food and Dairy Microbiology)**

**Course ID : 42213**

**Time: 1 Hour 15 Minutes**

**Full Marks: 25**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer *any five* questions from the following: 1×5=5
- (a) What is Vat pasteurization?
  - (b) What is starter culture?
  - (c) What do you mean by water activity?
  - (d) State the differences between food infection and food intoxication.
  - (e) What is putrefaction?
  - (f) Name the fungus which is used as a source of citric acid.
  - (g) What are class II chemical preservatives?
  - (h) What are mycotoxins? Give examples.
2. Answer *any two* questions from the following: 5×2=10
- (a) Define probiotics. State the basic characteristics of a probiotic. Mention some health benefits of it. 1+2+2=5
  - (b) What do you mean by green rots of egg? What are the sources of microbes in milk? 3+2=5
  - (c) Write short note on: 2½+2½=5
    - (i) TA spoilage
    - (ii) Flat sour spoilage
  - (d) State the term HACCP. Briefly mention seven principles of it. 2+3=5
3. Answer *any one* question from the following: 10×1=10
- (a) Briefly describe the physical methods of food preservation. Mention the significance of bacteriocin in food preservation. 8+2=10
  - (b) Briefly describe the steps involved in cheese production. Write a short note on pasteurization. What are the attractive features of single cell protein as food supplement. 3+4+3=10



SH-IV/MCB-405/SEC-2/19

**B.Sc. 4th Semester (Honours) Examination, 2019**

**MICROBIOLOGY**

**Paper : 405/SEC-2**

**(Microbial Diagnosis in Health Clinics)**

**Course ID : 42215**

**Time: 1 Hour**

**Full Marks: 40**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer the following multiple choice questions:

20×2=40

1. 'Rose spot' are related to
  - (a) Botulism
  - (b) Typhoid
  - (c) Dysentery
  - (d) Vibriosis
2. The 'Window period' states
  - (a) the time an organism takes to make entry into the host.
  - (b) the time an organism takes from the first infection to the appearance of symptoms.
  - (c) the time an organisms takes from the first infection for detection through a specific test.
  - (d) the time an organism takes to re-infect a host after primary recovery.
3. 'ELISA' stands for
  - (a) Enzyme Linked Immunosolvent Assay.
  - (b) Enzyme Linked Immunosorbent Assay.
  - (c) Enzyme Linked Immunological Assay.
  - (d) Enzyme Linked Immunosolution Assay.
4. The 'backbone fever' is also known as
  - (a) Dengue fever
  - (b) Tertian fever
  - (c) Typhoid fever
  - (d) Pel-Ebstein fever
5. MIC of an antibiotic indicates
  - (a) The minimum concentration of a drug at which all organisms can be killed.
  - (b) The maximum concentration of a drug at which all organisms can be killed.
  - (c) The minimum concentration of a drug at which growth of bacterium can be inhibited.
  - (d) The minimum concentration of a drug at which all microorganisms can be inhibited.
6. 'Widal Test' is being designed to detect
  - (a) HIV
  - (b) Dengue
  - (c) Salmonella
  - (d) All of the above

7. PCR stands for
- (a) Polymerase Chemical Reaction
  - (b) Polymerase Chain Reaction
  - (c) Polymorphism Chain Reaction
  - (d) None of the above
8. Growth of Gram positive bacteria become inhibited on MacConkey agar due to the presence of \_\_\_\_\_ in the medium.
- (a) Neutral Red
  - (b) Proteose Peptone
  - (c) Lactose
  - (d) Crystal violet and bile salts
9. The term 'HAART' stands for
- (a) Highly Active Antiretroviral Therapy.
  - (b) Highly Active Antiretroviral Treatment.
  - (c) Highly Active Antiretroviral Techniques.
  - (d) Heavily Active Antiretroviral Techniques.
10. The enzyme used in PCR is
- (a) Taq polymerase
  - (b) DNA polymerase
  - (c) DNA dependent DNA polymerase
  - (d) None of the above
11. Dengue fever is a viral infection caused by the Dengue virus. It is transmitted through the bite of the infected
- (a) Anopheles mosquito
  - (b) Culex mosquito
  - (c) Aedes mosquito
  - (d) All of the above
12. Coomb's test is
- (a) Antiglobulin test
  - (b) Complement test
  - (c) Agglutination test
  - (d) Neutralisation test
13. The best Laboratory method to diagnose AIDS is
- (a) RIA
  - (b) ELISA
  - (c) Western blot
  - (d) Complement fixation test
14. Lowenstein-Jensen Agar medium used to grow
- (a) *Bacillus*
  - (b) *E.coli*
  - (c) *Mycobacterium*
  - (d) None of the above
15. To isolate Gram-negative Enterobacteriaceae group media used from the following:
- (a) Nutrient Agar
  - (b) MacConkey Agar
  - (c) Luria-Bertanii broth
  - (d) Chocolate Agar
16. The mode of Action of Streptomycin is
- (a) attack on bacterial cell wall.
  - (b) breaks and coagulate lipid.
  - (c) create pores on cell membrane.
  - (d) blocking protein synthesis.

- 17.** Rice water stool is a symptom of
- (a) Cholera
  - (b) Dysentery
  - (c) Amoebiosis
  - (d) Hepatitis
- 18.** Reverse transcriptase-PCR is used in diagnosis of all except
- (a) Rota virus
  - (b) Polio virus
  - (c) Adeno virus
  - (d) Astro virus
- 19.** In blood agar medium, agar is used as
- (a) Carbon source
  - (b) Thickening agent
  - (c) Mineral source
  - (d) Nitrogen source
- 20.** Which of the following is a Enzyme based detection system of disease or infection?
- (a) PCR
  - (b) MIC
  - (c) ELISA
  - (d) RIA
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**SH-IV/MCB-401/C-8/(PR)/19**

**B.Sc. 4th Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**Paper : 401/C-8**

**(Microbial Genetics)**

**Course ID : 42221**

**Time: 1st Day: 2 Hours**

**Full Marks: 15**

**2nd Day: 30 Minutes**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Prepare replica plate from the supplied master plate. 7  
[Principle–2, Workout–3, Result–2]
  2. Demonstrate *any one*: 3
    - (i) Study the effect of UV mutagen on bacterial cell
    - (ii) AMES test
  3. Viva voce. 3
  4. Practical Record Book. 2
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*SH-IV/MCB-402/C-9(P-9)/19*

**B.Sc. 4th Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**Paper : 402/C-9(P-9)**

**(Environmental Microbiology)**

**Course ID : 42222**

**Time: 1st Day: 1-30 Hours**  
**2nd Day: 30 Minutes**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

- |  |    |
|--|----|
| 1. Determine the potability of provided water sample-(A).<br>[Principle-3, Workout-2, Observation and result-2, Comment-3] | 10 |
| 2. Viva Voce   | 3  |
| 3. Laboratory Notebook   | 2  |

**SH-IV/MCB-403/C-10/(PR)/19**

**B.Sc. 4th Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**Paper : 403/C-10**

**(Food and Dairy Microbiology)**

**Course ID : 42223**

**Time: 1st Day: 2 Hours**

**Full Marks: 15**

**2nd Day: 30 Minutes**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Perform the methylene blue reduction test (MBRT) of the supplied milk sample (A and B) and assess their quality. 5  
(Principle–1, Workout–1, Observation and Result–2, Comment–1)
  2. Isolate and enumerate spoilage bacteria from rotten fruit/vegetable (C) on the basis of colony morphology. 5  
(Principle–1, Workout–1, Observation and Result–2, Comment–1)
  3. Viva voce 3
  4. Laboratory Notebook 2
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*SH-IV/MCB-403/C-10/(PRI)/19*

**B.Sc. 4th Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**Paper : 403/C-10**

**(Food and Dairy Microbiology)**

**Course ID : 42223**

*Instruction to the Examiners.*

1. For Question No.1, sterile screw-cap test tubes, pipettes, raw and pasteurized milk sample (A and B), and reagents should be provided to the candidates.
2. For Question No.2, sterile nutrient agar, test tubes, pipettes, distilled water and rotten fruit/vegetable (C) has to be provided to the Candidates. Examiners are requested to keep arrangement of at least two sets of sample.
3. Key to the materials should be submitted along with the answer scripts.

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*SH-IV/MCB-401/C-8/(PRI)/19*

**B.Sc. 4th Semester (Honours) Practical Examination, 2019**

**MICROBIOLOGY**

**Paper : 401/C-8**

**(Microbial Genetics)**

**Course ID : 42221**

*Instructions to the Examiners.*

1. Internal examiners are requested to make master plate and agar plates to perform the experiment.
2. Internal examiners are requested to keep ready the materials, reagents and chemicals required for practical concerned.
3. Viva voce should be taken by at least two examiners. The time should be limited to maximum 5 minutes for each candidate. Questions should be asked on subject in which the candidates are being examined.
4. Evaluated answer scripts are to be sent to controller of examination within a week from the date of completion of examination.

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**B.Sc. 2nd Semester (Honours) Examination, 2019****MICROBIOLOGY****(Biochemistry)****Paper : SH/MCB/201/C-3****Course ID : 22211****Time: 1 Hour 15 Minutes****Full Marks: 25**

*The figures in the margin indicate full marks.  
Candidates are required to give their answers in their own words  
as far as practicable.  
The questions are equal value.*

1. Answer *any five* from the following: 1×5=5
- What is abzyme?
  - What do you mean by turn over of protein?
  - Name one pigment which is lipid in nature.
  - Name one even and one odd carbon fatty acid.
  - What are PUFA and MUFA?
  - Define Km.
  - Define mutarotation.
  - Give the structure of one sulfur containing amino acid.
2. Answer *any two* from the following: 5×2=10
- Classify proteins based on their function. Give suitable example wherever necessary. 5
  - What is inhibition? Describe briefly about competitive inhibition. 1+4=5
  - Which sugar is known as invert sugar and why is it so called? Write down the difference between reducing sugar and non-reducing sugar. 1+2+2=5
  - What do you mean by "18 : 3; 9, 12, 15"? Give the structure of cyclic fatty acid which is used in treatment of leprosy. Write down the difference between saturated fatty acid and unsaturated fatty acid. 2+1+2=5
3. Answer *any one* from the following: 10×1=10
- Briefly discuss the titration curve of aspartic acid where the  $pK_a^1$  is 2.1,  $pK_a^2$  is 3.9 and  $pK_a^3$  is 9.8. Draw the curve and calculate the pI. Discuss briefly about the clover-leaf model of t-RNA. 6+4=10
  - Write down the structure and properties of DNA. Enlist the difference between DNA and RNA. 7+3=10