R6022	Sub. Code 530101

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

First Semester

Microbiology

GENERAL MICROBIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Animalcules.
2. Archaea.
3. PHB.
4. Inclusion bodies
5. Cryophytic algae.
6. Mannoproteins.
7. Cytopathic effects.
8. PFU.
9. Anaerobic medium.
10. Abbe's condenser.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the contribution of Winogradsky to the study of Microbial Ecology.

Or

(b) Write notes on Carl Woes' three domain classification.

12. (a) Explain the characteristics and role of reserve food materials.

Or

(b) Sketch on structure, biochemistry and genetics of bacterial endospore.

13. (a) Describe the methods of reproduction in algae.

Or

(b) Discuss the nutritional strategies of fungi.

14. (a) List out the distinctive properties of virus.

Or

(b) Give short notes on viroid and prions.

15. (a) Write the principle and application of phase contrast microscopy.

Or

(b) Differentiate the enriched and selective media.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe on the Whittaker's five kingdom classification and give the characteristics of each kingdom.

17. Discuss on cell wall of gram negative and gram positive bacteria.

18. Explain the chemical composition and functions of fungal cell wall and membranes.

19. Elaborate the cultivation and purification of virus.

20. Differentiate TEM and SEM.

———————

R6023	Sub. Code
	530102

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

First Semester

Microbiology

MICROBIAL BIOCHEMISTRY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Epimers.
2. Dihroxyacetone phosphate.
3. Zwitter ions.
4. Optical isomerism.
5. Glycolipids.
6. Partial hydrogenation.
7. *V*max.
8. Non-competitive inhibition.
9. Adenylate cyclase.
10. β-Lactams.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Classify the polysaccharide and explain the structure and properties.

Or

(b) Illustrate the catabolic pathway for producing sugars through gluconeogenesis.

12. (a) Describe the structure and classification of amino acids based on the polarity.

Or

(b) Give notes on physical and chemical properties of protein.

13. (a) Write the properties. structure, function and classification of lipids.

Or

(b) Give an account on degradation of purine and pyrimidine.

14. (a) Describe the types of reaction takes place in major classes of enzyme.

Or

(b) Describe

(i) isozyme

(ii) ribozyme

(iii) abyzyme

15. (a) Summarize the properties and characteristics of cholera and botulism toxin.

Or

(b) Write the process of chlorophyll biosynthetic pathway.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Give detailed notes on energy requiring and energy releasing phase of glycolysis.

17. Write an essay on biosynthesis and degradation of amino acid.

18. Illustrate the enzymatic synthesis of phospholipids in *E. coli*.

19. Write an essay on mechanism of enzyme action.

20. Give detailed notes on biosynthesis and regulation of penicillin and streptomycin.

———————

R6024	Sub. Code
	530103

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

First Semester

Microbiology

MICROBIAL PHYSIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define synchronous culture.

2. What are halophilies?

3. Differentiate the oxygenic and anoxygenic photosynthesis.

4. What are uses of green sulphur bacteria?

5. What is nitrification?

6. Name the free living N_2 fixing bacteria.

7. How does the microbes tolerate to the thermal stress?

8. Differentiate the homolactic and heterolactic fermentation.

9. What is proton motive force?

10. Define osmosis.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Differentiate the batch and continuous culture.

Or

(b) How do you calculate the generation time in bacteria?

12. (a) Describe the cyclic and non cyclic photophosphorylation.

Or

(b) Write a note on structure and properties of bacteriochlorophyll.

13. (a) How do you perform acetylene reduction assay?

Or

(b) Illustrate the nitrogen cycle steps with microbial role in denitrification and ammonification.

14. (a) Briefly describe the adoption mechanism of microbes under nutrient and starvation stress.

Or

(b) Give an account on alcoholic fermentation pathway.

15. (a) Describe the principles and laws of thermodynamics.

Or

(b) Write a note on chemiosmotic theory of Mitchell.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the classification of microorganisms by nutrition and metabolic activity.

17. What is carbon assimilation? Briefly discuss the steps in CO_2 fixation by Calvin cycle.

18. Discuss in detail about the genetics of nitrogen fixation and properties of nitrogenase enzyme.

19. Describe the microbial stress responses and adoptive mechanisms under osmotic, oxidative, thermal stress.

20. Explain the TCA cycle with neat sketch.

———————

R6025	Sub. Code
	530501

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

First Semester

Microbiology

MOLECULAR BIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Chargaff's rule.
2. SnRNA.
3. Primasome.
4. Decatenation.
5. cDNA.
6. rho utilization site.
7. Shine-Dalgarno sequence.
8. Pribnow box.
9. Anaplasia.
10. Proto-oncogene.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the forms of DNA.

Or

(b) How DNA is proved as a genetic material?

12. (a) Explain the mechanism of helicase, primase and gyrase.

Or

(b) Discuss on semi conservative model of replication.

13. (a) Illustrate the reverse transcription process in prokaryotes.

Or

(b) Give brief notes on elongation process in transcription.

14. (a) Describe the role of rRNA in protein synthesis.

Or

(b) Discuss on genetic code and its characteristics.

15. (a) Explain the process of activation of oncogenes.

Or

(b) Explain the characteristics and functions of protein kinase.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the properties of DNA.

17. Schematically explain the molecular mechanism of DNA replication.

18. Define the structure, function and regulation of transcription factors.

19. Explain the post translational modification process.

20. Discuss on structure and detection of integral viral DNA.

———————

R6026	Sub. Code
	530301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

Third Semester

Microbiology

MEDICAL MICROBIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write Lancefield classification of *Streptococcus*.
2. Differentiate the resident flora from transient flora.
3. What is the use of Robertson's Cooked Meat medium?
4. What are the prophylactic measures of leprosy?
5. Define aspergillosis.
6. What is Castenad's method?
7. How does Leptospirosis transmitted?
8. What are uses of amantidine?
9. Write the causative agent and transmission of malaria.
10. What is the vaccination given for Rabies?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) How do you collect the urine specimen? Write a note on bacterial diagnosis of UTI.

Or

(b) Briefly describe the laboratory waste disposal system adopted in your microbiology laboratory.

12. (a) Describe the pathogenesis and lab diagnosis of *Staphylococcus* infection.

Or

(b) Write a short note on pathogenesis, transmission and diagnosis of anthrax.

13. (a) Give an account on causative agent, pathogenesis, treatment of typhoid.

Or

(b) Briefly describe the pathogenesis and diagnosis of syphilis.

14. (a) What is opportunistic mycosis? Briefly describe about the cryptococcosis.

Or

(b) Explain the transmission, symptoms and diagnosis of Ascaris worm infection.

15. (a) Write an account on properties and action of antiparasitic drugs.

Or

(b) Briefly describe the National programmes in prevention of infectious diseases.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe the pathogenesis, transmission and diagnosis of tuberculosis.

17. Explain the pathogenesis and laboratory diagnosis of *Escherichia coli*.

18. Discuss the clinical features, diagnosis and treatment of candidiasis.

19. Discuss in detail about the pathogenesis, transmission and diagnosis of malaria.

20. Explain the pathogenesis, transmission and control of HIV infection.

———————

R6027	Sub. Code 530302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

Third Semester

Microbiology

IMMUNOBIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Vasoactive amines.
2. PAMPS.
3. TCR.
4. scFv.
5. Zymogens.
6. Give some examples of DTH reaction.
7. MMR vaccine.
8. RVSV-ZEBOV vaccine.
9. Hematopoietic stem cell.
10. β microglobulin.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Differentiate between humoral and cell mediated immunity.

Or

(b) Give an account on neutrophils and macrophages.

12. (a) Illustrate the production of engineered antibodies.

Or

(b) Discuss on structure and functions of IgM molecule.

13. (a) Write notes on cytokines properties and functions.

Or

(b) Give brief notes on mechanism of immune regulation.

14. (a) Describe the mechanism of immune reactions against viral infection.

Or

(b) How the immune mechanism is activated toward protozoan diseases?

15. (a) Write notes on immunoelectrophoresis methods and principle.

Or

(b) Explain the strategies in ELISPOT reaction.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Elaborate on lymphoid organs and their functions.

17. Discuss the mechanism of monoclonal antibodies production.

18. Schematically explain the classical and alternate pathway of complement system.

19. Explain the process of developing live and attenuated vaccines.

20. Discuss in detail on the transplantation immunology.

———————

R6028	Sub. Code
	530303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

Third Semester

Microbiology

INDUSTRIAL MICROBIOLOGY

(CBCS – 2019 onwards)

Time : Three Hours Maximum : 75 Marks

Section A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What is auxanography?
2. What is fed batch fermentation?
3. What is scale up process?
4. What are photobioreactor?
5. How do you control foaming in fermentation?
6. Compare the batch and continuous culture
7. Define Sparger
8. What are the physical methods used in cell disruption?
9. Which method is used to detect the analog resistant mutants?
10. How does the centrifugation preferred method than the filtration in downstream process?

Section B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What techniques are commonly used to defect antibiotic producers from soil?

Or

(b) Microbial regulatory mechanism is necessary to develop the strains for higher yield of desired metabolite- Substantiate.

12. (a) Describe principle and uses of Disposable wave bioreactor.

Or

(b) How do you preserve the industrially important microbes by Lyophilization? Write the merit and demerit of lyophilization?

13. (a) Give an account on applications of immobilized enzymes.

Or

(b) What is production medium? Describe the carbon and nitrogen sources used in fermentation media preparation.

14. (a) What is SCP? Briefly describe merits, demerits and types of Microbial SCP.

Or

(b) How is citric acid produced? Give a flowchart for the manufacture of citric acid.

15. (a) Describe the filtration methods in recovery process.

Or

(b) What is fermentation economics? Discuss the economic measures of plant, media, production and recovery cost.

Section C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Define bioreactor? Explain the control mechanism of temperature, pH, O_2, heat and mass transfer in bioreactor.

17. What is strain improvement? Explain the strain improvement of *Streptomyces* by recombinant DNA technology.

18. Discuss the Plackett–Burman Design to evaluate most excellent production media using Response surface methodology.

19. Explain the industrial production of beer.

20. What is downstream process? Illustrate the steps involved in downstream process with neat sketch.

———————

R6029	Sub. Code
	530506

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021

Third Semester

Microbiology

MICROBIAL TECHNOLOGY

(CBCS – 2019 onwards)

Time : Three Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Bacteriophage
2. BOD
3. Vitamin assay
4. Pyrogen Test
5. Preservative
6. Biological Indicators
7. Physical Hazards
8. DNA microarray
9. ATP estimation
10. Barcoding

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain about the faecal indicator organisms

Or

(b) Give an account MPN test

12. (a) Give an account on role of preservatives

Or

(b) Write a short note on Microbial risk assessment through HACCP plan.

13. (a) Explain – Chromogenic methods

Or

(b) Give an account antibiotic susceptibility lest

14. (a) Explain the conventional methods used for the detection of microorganisms in food.

Or

(b) Give an account on risk assessment in food industry.

15. (a) Give an account on flow cytometry.

Or

(b) Write a short notes on the importance of barcoding.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain about mineral water quality assessment

17. Briefly describe about chemical preservative's role in food processing

18. Explain any two endotoxin test methods

19. Write the effect of light pulse on foods and microorganisms.

20. Explain about the recent development methods in assessment of microbial quality of marine foods.

———————