D 91520 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Microbiology

MBG 3E 03—BIO-SAFETY, BIOETHICS AND INTELLECTUAL PROPERTY RIGHTS

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Write about each of the following in 2 **or** *3 sentences.*
Each question carries 2 marks.

1. Autonomy.
2. ELSI.
3. Eugenics.
4. GM foods.
5. Risk assessment.
6. Regulatory authorizes of GMOs.
7. Transgenic plant.
8. BSL-I labs.
9. Parental diagnosis.
10. Reproductive cloning.
11. Genetic testing.
12. Trade mark.
13. Geographical indicators.
14. Patent.
15. Patent infringement.
16. Vector patentability.
17. UPOV convention.
18. Technology transfer.
19. Copyright.
20. Objectives of patents.

(20 × 2 = 40 marks)

Section B

Write notes **or** *discuss on any* **five** *of the following.*
Each question carries 8 marks.

21. Define Bioethics. Explain the major principles of bioethics with relevant examples/case studies.
22. What are the major biosafety aspects that need to be followed in a Microbiology laboratory ? Discuss in detail.

Turn over

23. What are the major guidelines and principles associated with the release of GMOs in the environment ?

24. What are the major steps and procedures involved in the drafting and applications of patents ?

25. What is IPR ? What are the types of IPs and discuss their applications with suitable examples ?

26. Prioritize the need, scope of protection of biotechnological intervention with suitable case studies.

27. Discuss the major patented research tools in modern Biotechnology with their application.

(5 × 8 = 40 marks)

D 91518 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Microbiology

MBG 3E 01—BIOINSTRUMENTATION

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Write about each of the following in two **or** *three sentences.*
Each question carries 2 marks.

1. Write the principle of affinity chromatography.
2. Mention the applications of Pulsed Field Gel Electrophoresis.
3. What is Retention factor ?
4. RTPCR.
5. Write the principle of RFLP.
6. Applications of Western blotting.
7. What is RCF ?
8. Ultrafiltration.
9. 2D-DIGE.
10. Principle of RIA.
11. Sandwich ELISA.
12. Differentiate between bright field Microscope and Phase contrast Microscope.
13. Applications of Immunofluorescence.
14. Write down the principle of chemilumenescence.
15. Agarose.
16. Beer Lambert's law.

17. Thermal cycler.

18. TEM.

19. Principle of Mass Spectrometry.

20. Components of PCR Mixture.

(20 × 2 = 40 marks)

Section B

Write notes on **or** *discuss any* **five** *of the following.*
Each question carries 8 *marks.*

21. Discuss the principle and instrumentation of Colourimeter.

22. Briefly describe the principle and procedure of Immunofluorescence. Mention its applications.

23. Discuss about protein sequencing methods.

24. Briefly describe different types of PCR techniques and its applications.

25. Discuss briefly about Mass Spectrometry in Structure analysis.

26. Discuss the principle and instrumentation of various Electrophoretic techniques.

27. Explain the principle and working of Electron Microscopy.

(5 × 8 = 40 marks)

D 91517 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Microbiology

MBG 3C 13—MEDICAL MICROBIOLOGY AND EMERGING DISEASES

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *in two* **or** *three sentences.*
Each question carries 2 *marks.*

1. CD4.
2. Variola.
3. *Borreliaburgdorferi.*
4. Teatanus toxins.
5. *Candida albicans.*
6. Congenital toxoplasmosis.
7. IgA protease.
8. Multidrug resistance.
9. Dengue haemorrhagic Fever.
10. *Aedesaegiptii.*
11. Hyaluronidase.
12. *Helicobacter pylori.*
13. Pneumonic plague.
14. PV leucocidin.
15. Hand, Foot and Mouth disease.
16. Canyon hypothesis.
17. Endotoxins.
18. EBV.
19. Botulinum toxin.
20. Bacterial capsule.

(20 × 2 = 40 marks)

Section B

Write notes **or** *discuss on any* **five.**
Each question carries 8 *marks.*

21. Write about emergence and re- emergence of infectious diseases.
22. Describe the different types of E. coli.
23. Give an account on opportunistic infections in AIDS.

Turn over

24. Write briefly on bioterrorism.

25. Explain tuberculosis and cholera.

26. Discuss the epidemiology and pathogenesis of diphtheria.

27. Give an account on exotoxins.

(5 × 8 = 40 marks)

D 91516 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Microbiology

MBG 3C 12—ENVIRONMENTAL MICROBIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Write about each of the following in 2 **or** *3 sentences.*
Each question carries 2 *marks.*

1. Antagonism.
2. Sulphur oxidizing bacteria.
3. Nif and nod gene.
4. Global warming.
5. Phylloplane.
6. Bacteriods.
7. VAM.
8. Associative symbiotic nitrogen fixation.
9. Droplet nuclei.
10. Factors affecting the presence of air microbial flora.
11. Airborne bacterial infection.
12. BOD.
13. Trickling filter.
14. Sewage.
15. Coliforms.
16. Auto aggregation of micro-organisms.
17. Flocs.
18. Land filling.
19. Bioleaching.
20. Biodeterioration.

(20 × 2 = 40 marks)

Turn over

Section B

Write note on **or** *discuss any* **five** *of the following.*

Each question carries 8 *marks.*

21. Elucidate various types of interactions occurred among micro-organisms in soil.

22. Discuss the various steps involved in sulfur cycle.

23. Illustrate the major methods involved in the quantification of microorganisms in air.

24. Discuss various steps involved the treatment of sewage.

25. Prioritize the relevance of microbial films and add a note on the steps involved in biofilm formation.

26. Discuss the environmental impact of GMOs with appropriate case studies.

27. Critically discuss the role of micro-organisms in biocorrosion.

(5 × 8 = 40 marks)

D 91050 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION NOVEMBER 2020

(CBCSS)

Microbiology

MBG 3E 03—MICROBIAL TAXONOMY

(2019 Syllabus Year)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each Section / Part.*
2. *The minimum number of questions to be attended from the Section / Part shall remain same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to maximum weightage of the Section / Part.*

Part A

Answer any **four** *briefly.*
Each question carries 2 *weightage.*

1. What is Phylogenetic classification ?
2. Comment on Phage typing.
3. What is Ribotyping ?
4. What is Numerical taxonomy ?
5. Write about the contributions of Carl Woese.
6. Comment on Mycoplasma.

(4 × 2 = 8 weightage)

Part B

Write short essays on any **four.**
Each question carries 3 *weightage.*

7. Five kingdom classification.
8. Spirochetes.
9. Chlamydia.
10. ELISA.

Turn over

11. DNA homology technique.

12. Domain Archae.

(4 × 3 = 12 weightage)

Part C

Answer any **two** *of the following.*
Each question carries 5 *weightage.*

13. Explain characters used in conventional classification of bacteria.

14. Discuss the molecular techniques used in classification.

15. Describe the classification of Gram positive bacteria.

16. Discuss the initial attempts in biological classification.

(2 × 5 = 10 weightage)

D 91049 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION, NOVEMBER 2020

(CBCSS)

Microbiology

MBG 3E 02—CELL BIOLOGY

(2019 Syllabus Year)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each Section / Part.*
2. *The minimum number of questions to be attended from the Section / Part shall remain same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to maximum weightage of the Section / Part.*

Section A (Short Answer Type Questions)

Answer any **four** *of the following.*
Each question carries 2 *weightage.*

1. Explain the molecular composition of cells.
2. Write a note on the structure and functions of lysosomes.
3. What are ion channels ? Explain voltage gated and ligand gated ion channels ?
4. What are the different phases of cell cycle ?
5. Explain programmed cell death.
6. What are tumor suppressor genes ?

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

Answer any **four** *of the following.*
Each question carries 3 *weightage.*

7. Elucidate the structure and functions of chloroplast.
8. Write a note on structure of nuclear pore complex and nuclear lamina.
9. Describe the assembly of peroxisomes.

Turn over

10. Explain the structure and functions of myosin.

11. Briefly describe the difference between mitosis and meiosis.

12. Describe the MAP kinase pathway.

(4 × 3 = 12 weightage)

Section C (Essay Type Questions)

Answer any **two** *of the following.*
Each question carries 5 *weightage.*

13. Describe elaborately on the molecular organization of chromatin in the nucleus.

14. Discuss in detail the protein import to mitochondria.

15. Delineate the structure, organization and functions of microtubules.

16. Discuss the series of events that occur during the glucose release in response to epinephrine.

(2 × 5 = 10 weightage)

D 91048 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION NOVEMBER 2020

(CBCSS)

Microbiology

MBG 3E 01—DIAGNOSTIC MICROBIOLOGY

(2019 Syllabus Year)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each Section / Part.*
2. *The minimum number of questions to be attended from the Section / Part shall remain same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to maximum weightage of the Section / Part.*

Draw Diagrams wherever necessary.

Section A

Write short notes on any **four** *of the following.*

Each question carries 2 *weightage.*

1. Biphasic broth slide blood culture system.
2. Pulsed field gel electrophoresis.
3. Restriction endonucleases.
4. Ribotyping.
5. Chemiluminescence immunoassay.
6. Rolling-circle amplification.

(4 × 2 = 8 weightage)

Section B

Write short essays on any **four** *of the following.*

Each question carries 3 *weightage.*

7. Radioimmunosorbent test.
8. Microarrays.

Turn over

9. Agarose gel electrophoresis.
10. Direct immunofluorescence.
11. Southern blotting.
12. Hybrid capture assay.

(4 × 3 = 12 weightage)

Section C

Write essays on any **two** *of the following.*

Each question carries 5 weightage.

13. Discuss the advancements in antigen and antibody detection for diagnosis of infectious diseases.
14. Write a note on different types of PCR techniques and their application in diagnosis of infections.
15. Write on enzyme linked immunosorbent assay and its application in disease diagnosis.
16. Write a note on advances in detection and identification of *Mycobacterium tuberculosis* in clinical specimens.

(2 × 5 = 10 weightage)

D 91047 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION, NOVEMBER 2020

(CBCSS)

Microbiology

MBG 3C 10—MOLECULAR BIOLOGY

(2019 Syllabus Year)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each Section/Part.*
2. *The minimum number of questions to be attended from the Section/Part shall remain same.*
3. *There will be an overall ceiling for each Section/Part that is equivalent to maximum weightage of the Section/Part.*

Section A (Short Answer Type Questions)

Answer any **four** *of the following.*
Each question carries 2 *weightage.*

1. Aminoacyl-tRNA Synthetase.
2. RNA splicing.
3. Function of IF 1 and IF 2.
4. Telomere and Telomerase.
5. Tumor suppressor proteins.
6. Protein folding.

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

Answer any **four** *of the following.*
Each question carries 3 *weightage.*

7. Double helical structure of DNA.
8. Oncogenes and Proto-ongogenes.
9. Three possible mode of DNA replication.

Turn over

10. Trp operon and its regulation.

11. Explain the structure and function of Telomere and Telomerase.

12. DNA polymerases of eukaryotes.

(4 × 3 = 12 weightage)

Section C (Essay Type Questions)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

13. Describe the types of damages occur in DNA and various repair mechanisms.

14. Explain in detail how hormones regulate gene regulation.

15. Describe translation in Prokaryotes.

16. Explain eukaryotic chromosome organization.

(2 × 5 = 10 weightage)

D 91046 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION, NOVEMBER 2020

(CBCSS)

Microbiology

MBG 3C 09—MEDICAL MICROBIOLOGY

(2019 Syllabus Year)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each Section/Part.*
2. *The minimum number of questions to be attended from the Section/Part shall remain same.*
3. *There will be an overall ceiling for each Section/Part that is equivalent to maximum weightage of the Section/Part.*

Draw Diagrams Wherever Necessary.

Section A

Write short notes on any **four** *of the following.*
Each question carries 2 *weightage.*

1. Classification of *Streptococci*.
2. Nipah virus.
3. Amoebic dysentery.
4. Antiretroviral agents.
5. *Helicobacter pylori.*
6. Piedra.

(4 × 2 = 8 weighatge)

Section B

Write short essays on any **four** *of the following.*
Each question carries 3 *weightage.*

7. Write a note on menigococal meningitis
8. Methods for diagnosis of viral hepatitis
9. Write note on etiology, pathogenesis and diagnosis of mycetoma
10. Discuss the life-cycle and pathogenesis of *Ancylostoma duodenale.*

Turn over

11. Describe the classification of antibiotics.

12. Discuss the methods used for the diagnosis of syphilis.

(4 × 3 = 12 weightage)

Section C

Write essays on any **two** *of the following.*
Each question carries 5 *weightage.*

13. Describe the etiology, pathogenesis and laboratory diagnosis of pulmonary tuberculosis.

14. Describe the characteristics of HIV. Write on pathogenesis and laboratory diagnosis of AIDS.

15. Discuss the morphology and life-cycle of *Trypanosoma*. Add a note of pathogenesis and laboratory diagnosis of Trypanosomiasis.

16. Write notes on etiology, pathogenesis and laboratory diagnosis of Histoplasmosis.

(2 × 5 = 10 weightage)