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**BSH 451**

**Second Semester M.Sc. Degree Examination, Sept./Oct. 2022**

**BIOSCIENCES**  
**Molecular Biology**

Time : 3 Hours

Max. Marks : 70

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

**(4×4=16)**

- Central dogma of molecular biology
- B-DNA
- End problem of replication in eukaryotes
- Control of prokaryotic DNA replication
- Variation in codon usage
- Eukaryotic promoters.

Write explanatory notes on **any five** of the following :

**(5×6=30)**

- Homologous recombination
- DNA polymerase types
- Protein folding
- Trp operon attenuation
- Structure of m-RNA
- RNA processing
- Inhibitors of protein synthesis.

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

**(2×12=24)**

- Discuss molecular basis of signal transduction in animals.
  - Give an account of prokaryotic protein synthesis.
  - Describe DNA transcription in eukaryotes.
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**BSH 452**

**II Semester M.Sc. Degree Examination, Sept./Oct. 2022**  
**BIOSCIENCES**  
**Biostatistics and Bioinformatics**

Time : 3 Hours

Max. Marks : 70

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

**(4×4=16)**

1. a) Measures of central tendency.
- b) Binomial distribution.
- c) Multiple regression.
- d) Correlation coefficient.
- e) NCBI.
- f) GCG wisconsin package.

Write explanatory notes on **any five** of the following :

**(5×6=30)**

2. Graphical representation of data.
3. Sampling techniques.
4. Probability distribution.
5. Statistical packages.
6. Scope of bioinformatics.
7. Distributed computing.
8. Molecular docking.

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

**(2×12=24)**

9. What are the tools used for studying protein folding ?
10. Calculate standard deviation for the following data recorded on number of pods in pea plant.

<b>No. of Pods/Plant</b>	7	8	9	10	11	12
<b>No. of Plant</b>	5	9	14	16	13	7

11. Explain about nucleotide sequence databases and how they are maintained and retrieved by researchers.



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**BSS 453**

**Second Semester M.Sc. Degree Examination, September/October 2022**  
**(CBCS)**  
**BIOSCIENCES**  
**Applied Microbiology**

Time : 3 Hours

Max. Marks : 70

1. Write short notes on **any four** of the following (**not exceeding 2 pages each**) : **(4×4=16)**
- Microbes in the extreme environments.
  - Food spoilage microorganisms.
  - Bioconversion and decomposition.
  - Water quality and microbial indicators.
  - Fungal toxins.
  - Probiotics.

Write explanatory notes on **any five** of the following (**not exceeding 3 pages each**) : **(5×6=30)**

- Rumen microbiota and their role in digestion.
- Milk borne pathogens and symptoms of infection.
- Methods used for the estimation of soil microbial load.
- MPN method and its applications in water quality.
- Major components of the air microflora.
- Advantages and disadvantages of bioremediation using microbes.
- Critical environmental issues with genetically modified microorganisms.

P.T.O.



Write essay on **any two** of the following (**not exceeding 8 pages each**) : (2×12=24)

9. Explain the fermentation process with suitable example. Add note on different microbial strains used for production of ethanol and lactic acid.
10. Explain in detail on the water-borne diseases and importance of water quality standards.
11. Soil microbes have significant role in maintaining the soil health. Justify with rational discussion.

Time : 3 Hours

1. Write short notes on any four of the following (not exceeding 2 pages each) : (4×4=16)

- a) Microbes in the extreme environments.
- b) Food spoilage microorganisms.
- c) Bioconversion and decomposition.
- d) Water quality and microbial indicators.
- e) Fungal toxins.
- f) Probiotics.

Write explanatory notes on any five of the following (not exceeding 3 pages each) : (5×6=30)

1. Fungi and their role in digestion.
2. Milk borne pathogens and symptoms of infection.
3. Methods used for the estimation of soil microbial load.
4. MPN method and its applications in water quality.
5. Major components of the air microflora.
6. Advantages and disadvantages of bioremediation using microbes.
7. Critical environmental issues with genetically modified microorganisms.



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**BSS 454**

**Second Semester M.Sc. Degree Examination, Sept./Oct 2022**

**(CBCS)**

**BIOSCIENCES  
Aquatic Biology**

Time : 3 Hours

Max. Marks : 70

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

**(4×4=16)**

1. a) El-Nino effect
- b) Dissolved oxygen
- c) Wetland
- d) Red tide
- e) Shelford's law of tolerance
- f) Sea weeds.

Write explanatory notes on **any five** of the following.

**(5×6=30)**

2. Hydrological cycle.
3. Coral reef community.
4. Shellfish poisoning.
5. Basic concepts and factors affecting the biological productivity in aquatic ecosystems.
6. Classification and distribution of plankton and their role in water quality.
7. Types, adaptations and economic importance of halophytes.
8. Biological control of aquatic pollution .

P.T.O.



Answer any two of the following.

(2x12=24)

- 9. Discuss the structural and functional adaptations of aquatic organisms to temperature and light.
- 10. Explain the physico-chemical conditions and biological diversity of estuaries.
- 11. Give a detailed account on the distribution of aquatic fauna and their economic importance.

(4x4=16)

Write short notes on any four of the following

- 1. a) El-Nino effect
- b) Dissolved oxygen
- c) Wetland
- d) Red tide
- e) Shelford's law of tolerance
- f) Sea weeds.

(5x6=30)

Write explanatory notes on any five of the following

- 1. Hydrological cycle.
- 2. Coral reef community.
- 3. Shellfish poisoning.
- 4. Basic concepts and factors affecting the biological productivity in aquatic ecosystems.
- 5. Classification and distribution of plankton and their role in water quality.
- 6. Types, adaptations and economic importance of halophytes.
- 7. Biological control of aquatic pollution.



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**BSE 461**

**Second Semester M.Sc. Degree Examination, Sept./Oct. 2022**

**BIOSCIENCES**

**(CBCS)**

**Biodiversity and Conservation (Open Elective)**

Time : 3 Hours

Max. Marks : 70

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

**(4×4=16)**

- a) Hotspots of biodiversity
- b) Sacred groves
- c) Lichens
- d) Biosphere reserve
- e) Boreal forests
- f) Cultivation of bacteria.

Write explanatory notes on **any five** of the following :

**(5×6=30)**

2. Lower group of plants.
3. Cyanobacteria.
4. Centres and significance of biodiversity studies.
5. IUCN Red list categories and criteria.
6. Diversity and abundance indices.
7. Parasites.
8. Edible mushrooms.

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

**(2×12=24)**

9. Classify the major ecosystems and explain in detail any two ecosystems you have studied.
  10. Explain in-situ and ex-situ conservation using suitable examples.
  11. Explain the various plant and animal associations and their significance in ecosystem functions.
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BSH 551

Reg. No.



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

(2×12=24)

9. Describe transgenic microbes and their applications. Add a note on its advantages and disadvantages.
10. Discuss the process and application of transgenic crop improvement techniques for disease and herbicide resistance in plants.
11. What are expression systems ? Explain their types and application in various hosts.

(4×4=16)

Write short notes on any four of the following.

1. a) Biopesticides
- b) Synthetic seeds
- c) Stem cells
- d) Restriction enzymes
- e) DNA fingerprinting
- f) Single cell proteins.

(5×6=30)

Write explanatory notes on any five of the following.

1. Fermentation techniques: types and applications.
2. Protoplast culture, fusion and hybridoma technology.
3. Super ovulation and cloning.
4. PCR and RT-PCR techniques and their applications.
5. Microbial polysaccharides and bioplastics.
6. Plant derived antibodies and vaccines.
7. Cytotoxicity and cell viability assays.

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**BSS 553**

**Fourth Semester M.Sc. Degree Examination, Sept./Oct. 2022**  
**(CBCS)**  
**BIOSCIENCES**  
**Developmental Biology**

Time : 3 Hours

Max. Marks : 70

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

**(4×4=16)**

1. a) Cellular differentiation.
- b) Fate maps.
- c) Blastula.
- d) Totipotency.
- e) Ultrastructure of egg.
- f) Leydig cells.

Write explanatory notes on **any five** of the following :

**(5×6=30)**

2. Previtellogenesis.
3. Structure of gastrula.
4. Chemical factors involved in fertilization.
5. Nuclear transfer experiments.
6. Gametogenesis in plant system.
7. Germ layers.
8. Homeobox concept.

Write essay on **any two** of the following :

**(2×12=24)**

9. Explain germ cell determinants and germ cell migration in different species.
10. Describe the ultrastructure of mature mammalian sperm and add a note on spermatogenesis.
11. Discuss the mechanism of gene action during cell differentiation.