D 14097 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE [REGULAR] EXAMINATION NOVEMBER 2021

(CBCSS)

Biology

BIO 3E 0902—OMICS AND MOLECULAR MEDICINE I : PROTEOMICS AND METABOLOMICS

(2020 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

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

I. Answer any *four* of the following. (Short Answer type questions) (Weightage 2) :

1 Describe the Electrophoretic approach for the separation of proteins.

2 Explain the process of phosphorylation of proteins.

3 Explain the methods to study protein DNA interactions.

4 Describe the isotope label based proteomics.

5 What is molecular docking ?

6 Approaches to study metabolic fluxes.

7 What do you mean by signal noise and signal drift in Mass spectrometry ?

(4 × 2 = 8 weightage)

II. Answer any *four* of the following (Short essay type questions) (Weightage-3)

8 Give an outline of the applications of proteomics.

9 Explain the stages and application of docking.

10 Outline the techniques to study metabolome.

11 Describe the nutrient fluxes in the systems.

12 Explain the methods used for quantitative proteomics.

13 Explain how NMR is used to study the structure of proteins.

14 What is phylogenetic analysis ? Explain different approaches for tree construction.

(4 × 3 = 12 weightage)

III. Answer any *two* of the following (Long essay type questions) (Weightage-5) :

15 Explain the multidimensional approach to study protein structural conformation.

16 Describe various methods used for the quantification of proteins.

17 Describe the methods to study interactions of proteins.

18 What are proteomics ? Outline the applications of proteomics.

(2 × 5 = 10 weightage)

D 14096 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION NOVEMBER 2021

(CBCSS)

Biology

BIO 3E 0901—MOLECULAR MEDICINE AND VIROLOGY—I : GENOMICS

(2020 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

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

I. Answer any *four* of the following (Short Answer type questions) (Weightage 2) :

1 BAC vector.

2 C value paradox.

3 Physical map of genome.

4 Restriction mapping.

5 Shotgun sequencing of genome.

6 Gene families.

7 Gene annotation and the process of annotation.

(4 × 2 = 8 weightage)

II. Answer any *four* of the following (Short essay type questions) (Weightage 3) :

8 cDNA Microarray technology.

9 Synthetic genomes and their applications.

10 Outline of the 1000 genome project.

Turn over

11 DNA Markers you have studied.

12 Organisation of genome in Bacteria.

13 What are cytological maps ? How they are constructed ?

14 Significance of genomes of organisms.

(4 × 3 = 12 weightage)

III. Answer any *two* of the following (Long essay type questions) (Weightage 5) :

15 Explain the detailed structure of DNA.

16 Give a detailed account of organisation of eukaryotic genome.

17 Explain various methods used for physical mapping of genome.

18 Outline of Human Genome Project.

(2 × 5 = 10 weightage)

D 14095 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION NOVEMBER 2021

(CBCSS)

Biology

BIO 3C 08—BIOSTATISTICS, BIOINFORMATICS AND RESEARCH METHODOLOGY

(2020 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

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

Part A

I. Answer any *four* of the following (Short Answer Type Questions) (Weightage-2) :

1 Explain the following :

a) ISSN Number.

b) Science citation number.

2 Plagiarism.

3 SWISSPROT & NBRF-PIR.

4 Coefficient of correlation.

5 Arithmetic mean.

6 Skewness and kurtosis.

7 EMBL.

(4 × 2 = 8 weightage)

Part B

II. Answer any *four* of the following (Short Essay Type Questions) (Weightage-3) :

8 SPSS.

9 Tabulation of data.

10 Test of significance.

11 What is meant by regression analysis. Explain the methods of regression analysis

12 Explain the principles of homology and comparative modelling.

13 What are the components of a scientific thesis ? Explain in detail.

14 What is the need of publishing research ? Explain how a research paper can be published.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following (Long Essay Type Questions) (Weightage-5) :

15 Explain Probability distributions. Explain the different types.

16 What are databases ? Give an outline of biological databases.

17 Explain various methods of graphical representation of data.

18 What is meant by central tendency ? What are the different types of measurement ?

(2 × 5 = 10 weightage)

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Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION NOVEMBER 2021

(CBCSS)

Biology

BIO 3C 07—CELL BIOLOGY AND GENETICS

(2020 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

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

Part A (Short Answer Type Questions)

I. Answer any *four* of the following. Weightage 2 :

1 Explain Cell theory.

2 Provide an outline of cytoskeletal proteins.

3 What is Apoptosis ?

4 What are Chaperons ? Add a note on its role in protein folding.

5 Give an outline of linkage and crossing over.

6 Explain the concept of autosomes and allosomes.

7 Molecular clock.

(4 × 2 = 8 weightage)

Part B (Short Essay Type Questions)

II. Answer any *four* of the following. Weightage 3 :

8 Explain the mechanisms of movement of cells.

9 Give an outline of transport across ER and Golgi.

10 Explain the numerical aberrations.

11 Explain the genetics of blood groups in human beings.

12 Explain karyotyping and its importance.

13 Give an outline of cell-to-cell interactions.

14 Explain the structure and function of ribosomes.

(4 × 3 = 12 weightage)

Part C (Long Essay Type Questions)

III. Answer any *two* of the following. Weightage 5 :

15 Explain the role of cyclins and cyclin dependent kinases in Cell cycle regulation.

16 Describe the ultrastructure of Nucleus with a diagram.

17 Explain special types of chromosomes found in organisms.

18 Give an outline of Fluid mosaic model of plasma membrane.

(2 × 5 = 10 weightage)