**18BT54**

# Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN | | | | | | | | | | |

## Fifth Semester B.E. Degree Examination

## Genomics and Proteomics

**TIME: 03 Hours** **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| | | | |
|---|---|---|---|
| **Module – 1** | | | |
| **Q.1** | **(a)** | Describe Polymorphisms. Explain the types of polymorphism. | 10 |
| | **(b)** | Describe the DNA sequence analysis methods. | 10 |
| **OR** | | | |
| Q.2 | (a) | Explain on Fluorescencemethod of Sequencing. | 06 |
| | **(b)** | ExplainExtraction of DNA by using CTAB. | 08 |
| | **(c)** | Illustrate shot-gun approach of sequencing. | 06 |
| **Module – 2** | | | |
| **Q.3** | **(a)** | Explain Gene variation and Single Nucleotide Polymorphisms. | 10 |
| | **(b)** | Explain Expressed Sequence Tags (ESTs). | 10 |
| **OR** | | | |
| **Q.4** | **(a)** | Discuss on Human genome project and the genetic map. | 10 |
| | **(b)** | Illustrate on Genotyping tools - DNA Chips. | 10 |
| **Module – 3** | | | |
| **Q.5** | **(a)** | Explain General architecture of eukaryotic genome. | 10 |
| | **(b)** | Illustrate Regulation of transcription. | 10 |
| **OR** | | | |
| **Q.6** | **(a)** | Explain the Scope of Functional genomics | 7 |
| | **(b)** | DiscussGene Knockdown technology. | 7 |
| | **(c)** | Write Short note on Gene Editing - Crispr Cas9 | 6 |

| | | | |
|---|---|---|---|
| **Module – 4** | | | |
| **Q.7** | **(a)** | Discuss in Detail on Molecular markers - RFLP, RAPD | 10 |
| | **(b)** | Briefly describe Methods of molecular mapping. | 10 |
| **OR** | | | |
| **Q.8** | **(a)** | List and explain on CAPS, microsatellites and SNPs. | 8 |
| | **(b)** | Describe with anMicro-array in functional genomics. | 8 |
| | **(c)** | Discuss in detail Telomerase as molecular markers. | 4 |
| **Module – 5** | | | |
| **Q.9** | **(a)** | What is the role of Two-dimensional PAGE in proteome analysis? Explain. | 10 |
| | **(b)** | Explain Mass-spec based analysis of protein expression | 10 |
| **OR** | | | |
| **Q.10** | **(a)** | How does Edman protein microsequencing works? | 6 |
| | **(b)** | Explain Detection of proteins on SDS gels. | 8 |
| | **(c)** | Explain Applications of proteome analysis to drug development and toxicology. | 6 |

**********

**Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome**

| Question | | Bloom's Taxonomy Level attached | Course Outcome | Programme Outcome |
|---|---|---|---|---|
| **Q.1** | (a) | L2 | CO1 | PO12 |
| | (b) | L2 | CO1 | PO12 |
| | | | | |
| **Q.2** | (a) | L1 | CO1 | PO12 |
| | (b) | L1 | CO1 | PO12 |
| | (c) | L2 | CO1 | PO12 |
| **Q.3** | (a) | L2 | CO1 | PO10 |
| | (b) | L2 | CO1 | PO10 |
| | | | | |
| **Q.4** | (a) | L2 | CO1 | PO10 |
| | (b) | L1 | CO1 | PO10 |
| | | | | |
| **Q.5** | (a) | L1 | CO1 | PO10 |
| | (b) | L2 | CO1 | PO10 |
| | | | | |
| **Q.6** | (a) | L3 | CO1 | PO10 |
| | (b) | L1 | CO1 | PO10 |
| | c | L1 | CO1 | |
| **Q.7** | (a) | L1 | CO3 | PO9 |
| | (b) | L1 | CO2 | PO11 |
| | | | | |

| | | | | |
|---|---|---|---|---|
| **Q.8** | (a) | L1 | CO3 | PO9 |
| | (b) | L2 | CO2 | PO11 |
| | (c) | L1 | CO3 | PO9 |
| **Q.9** | (a) | L1 | CO4 | PO8 |
| | (b) | L1 | CO4 | PO8 |
| | | | | |
| **Q.10** | (a) | L3 | CO4 | PO8 |
| | (b) | L2 | CO4 | PO8 |
| | (c) | L1 | CO4 | PO8 |

| **Bloom's Taxonomy Levels** | **Lower order thinking skills** | | |
|---|---|---|---|
| | Remembering ( knowledge): □ 1 | Understanding Comprehension) : □ 2 | Applying (Application): □ 3 |
| | **Higher order thinking skills** | | |
| | Analyzing (Analysis): □ 4 | Valuating (Evaluation): □ 5 | Creating (Synthesis): □ 6 |

# Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN | | | | | | | | | | |

## Fifth Semester B.E. Degree Examination

## Genomics and Proteomics

**TIME: 03 Hours** **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| | | | |
|---|---|---|---|
| | | **Module – 1** | |
| **Q.1** | **(a)** | Give a brief note on the databases and tools used for Genome studies | 06 |
| | **(b)** | Explain Sanger's dideoxy method for DNA sequencing | 08 |
| | **(c)** | Define polymorphism. Explain different types of polymorphism. | 06 |
| | | **OR** | |
| **Q.2** | **(a)** | Explain the methods of preparation of Genomic DNA for Sequencing | 06 |
| | **(b)** | Explain with principle any one method of Next generation sequencing(NGS) | 08 |
| | **(c)** | Elucidate the relationship between genes and proteins | 06 |
| | | **Module – 2** | |
| **Q.3** | **(a)** | What are SNPs? What are various methods used for detection of SNPs? Explain any one method in detail with figure | 10 |
| | **(b)** | Write short note on Gene-disease association and DNA chip | 10 |
| | | **OR** | |
| | **(a)** | Write about expressed sequenced tags(EST's) in genomics. How it is to be analyzed by using Bioinformatics tools. | 10 |

| | | | |
|---|---|---|---|
| **Q.4** | | | |
| | **(b)** | Discuss in detail Human genome project | 10 |
| **Module – 3** | | | |
| **Q.5** | **(a)** | Explain different features of "C value Paradox" | 10 |
| | **(b)** | Discuss the role of transcription factors in regulation of eukaryotic gene expression | 10 |
| **OR** | | | |
| **Q.6** | **(a)** | What are Genome editing? Write a note on CRISPR-Cas9 | 10 |
| | **(b)** | Explain the organization of genome within mitochondrial and chloroplast. | 10 |

| | | | |
|---|---|---|---|
| **Module – 4** | | | |
| **Q.7** | **(a)** | What are genetic and physical maps in genome mapping? Explain how RFLP can be used as a molecular marker in mapping. | 10 |
| | **(b)** | Describe the differential display RT-PCR | 10 |
| **OR** | | | |
| **Q.8** | **(a)** | Describe FISH as a means of physical mapping approach | 10 |
| | **(b)** | Explain T-DNA and transposon tagging in identification of new genes | 10 |
| **Module – 5** | | | |
| **Q.9** | **(a)** | Describe the general techniques of protein isolation and purification | 10 |
| | **(b)** | Explain in detail two hybrid interaction screens | 10 |
| **OR** | | | |
| **Q.10** | **(a)** | Explain the principle, procedure & application of Mass Spectroscopy in proteomics | 10 |
| | **(b)** | Explain 2D SDS-PAGE | 10 |

**********

**Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome**

| **Question** | | **Bloom's Taxonomy Level attached** | **Course Outcome** | **Programme Outcome** |
|---|---|---|---|---|
| **Q.1** | (a) | L2 | CO1 | PO1 |
| | (b) | L3 | CO1 | PO1 |
| | (c) | L2 | CO1 | PO1 |
| **Q.2** | (a) | L2 | CO1 | PO1 |
| | (b) | L3 | CO1 | PO1 |
| | (c) | L2 | CO1 | PO1 |
| **Q.3** | (a) | L2 | CO2 | PO1 |
| | (b) | L3 | CO2 | PO1 |
| **Q.4** | (a) | L2 | CO2 | PO1 |
| | (b) | L3 | CO2 | PO1 |
| **Q.5** | (a) | L2 | CO3 | PO1 |
| | (b) | L2 | CO3 | PO1 |
| **Q.6** | (a) | L2 | CO3 | PO1 |
| | (b) | L2 | CO3 | PO1 |
| **Q.7** | (a) | L3 | CO3 | PO7 |
| | (b) | L3 | CO | PO5 |
| **Q.8** | (a) | L3 | CO | PO5 |
| | (b) | L3 | CO | PO1 |
| **Q.9** | (a) | L2 | CO5 | PO3 |
| | (b) | L3 | CO5 | PO3 |
| **Q.10** | (a) | L2 | CO5 | PO5 |
| | (b) | L3 | CO5 | PO5 |

| **Bloom's Taxonomy** | **Lower order thinking skills** | | |
|---|---|---|---|
| | Remembering ( knowledge): $L_1$ | Understanding Comprehension) : $L_2$ | Applying (Application): $L_3$ |

| Levels | Higher order thinking skills | | |
|---|---|---|---|
| | Analyzing (Analysis): $L_4$ | Valuating (Evaluation): $L_5$ | Creating (Synthesis): $L_6$ |
| | | | |

# Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN | | | | | | | | | | |

## Fifth Semester B.E. Degree Examination

## Genomics and Proteomics

**TIME: 03 Hours** **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

| | | | |
|---|---|---|---|
| **Module – 1** | | | |
| **Q.1** | **(a)** | What is polymorphism? Explain different type of polymorphisms with suitable examples. | 8 |
| | **(b)** | Explain Sanger dideoxy method of DNA sequencing in comparison with fluorescence method DNA sequencing. | 6 |
| | **(c)** | Summarize on genome project on E.coli genome project and its databases. | 6 |
| **OR** | | | |
| **Q.2** | **(a)** | What is NGS?Explain Illumina NGS method of sequencing | 08 |
| | **(b)** | Discuss in detail Ion torrent method sequencing, Add a note on its benefits and its limitation | 06 |
| | **(c)** | Explain shot gun approach of DNA sequencing method | 06 |
| **Module – 2** | | | |
| **Q.3** | **(a)** | Explain specific goal, sequencing strategies, mapping strategies and application of HGP | 08 |
| | **(b)** | Summarize on genome project on E.coli genome project and its databases. | 06 |
| | **(c)** | Write a note on rice genome project | 06 |
| **OR** | | | |
| **Q.4** | **(a)** | What are ESTs? Explain the constructions and applications of ESTs. | 06 |
| | **(b)** | Explain specific goals of functional genomics with reference to C.elegans as a model system | 06 |
| | **(c)** | Describe the steps involved in DNA chip technology with interpretation of results. | 08 |
| **Module – 3** | | | |
| **Q.5** | **(a)** | Discuss in detail about mechanism of RNA silencing and its application. | 08 |
| | **(b)** | Describe the genome organization with in mitochondria | 06 |
| | **(c)** | Explain C-value of genome | 06 |
| **OR** | | | |
| **Q.6** | **(a)** | Discuss in detail about General architecture of eukaryotic genome | 08 |
| | **(b)** | Illustrate on Gene Editing -Crispr Cas9 | 08 |
| | **(c)** | Write a short note on transcription factor | 04 |

| | | | |
|---|---|---|---|
| **Module – 4** | | | |
| **Q.7** | **(a)** | What are molecular markers? Explain RFLP and RAPD with suitable examples | 08 |
| | **(b)** | Describe the methods of detection of SNPs. | 06 |
| | **(c)** | Explain working principles of FISH a physical map and its application. | 06 |
| **OR** | | | |
| **Q.8** | **(a)** | Explain telomerase as a molecular marker. | 08 |
| | **(b)** | Explain the steps involved in SCAR marker preparation as a tool in molecular mapping. | 06 |
| | **(c)** | Write an explanatory note on AFLP and its advantage and disadvantage. | 06 |
| **Module – 5** | | | |
| **Q.9** | **(a)** | Summarize important method protein isolation, quantification and purification in detail. | 10 |
| | **(b)** | Explain in detail about 2D gel electrophoresis techniques | 10 |
| **OR** | | | |
| **Q.10** | **(a)** | Experiment on yeast two hybrid screening to study protein- protein interaction. | 10 |
| | **(b)** | Explain the principles, Instrumentation and application of MALDI-TOF | 10 |

**********

| Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome | | | | |
|---|---|---|---|---|
| **Question** | | **Bloom's Taxonomy Level attached** | **Course Outcome** | **Programme Outcome** |
| **Q.1** | (a) | L1,L2 | CO1 | PO12 |
| | (b) | L2 | CO1 | PO12 |
| | (c) | L2 | CO1 | PO12 |
| **Q.2** | (a) | L1,L2 | CO1 | PO12 |
| | (b) | L2 | CO1 | PO12 |
| | (c) | L2 | CO1 | PO12 |
| **Q.3** | (a) | L2 | CO2 | PO10 |
| | (b) | L2 | CO2 | PO10 |
| | (c) | L2 | CO2 | PO10 |
| **Q.4** | (a) | L2 | CO2 | PO10 |
| | (b) | L2 | CO2 | PO10 |
| | (c) | L2 | CO2 | PO10 |
| **Q.5** | (a) | L2 | CO3 | PO10 |
| | (b) | L2 | CO3 | PO10 |
| | (c) | L4 | CO3 | PO10 |
| **Q.6** | (a) | L3 | CO3 | PO10 |
| | (b) | L2 | CO3 | PO10 |
| | (c) | L2 | CO3 | PO10 |
| **Q.7** | (a) | L1,L2 | CO4 | PO9 |
| | (b) | L4 | CO4 | PO11 |
| | (c) | L2 | CO4 | PO9 |
| **Q.8** | (a) | L2 | CO4 | PO9 |
| | (b) | L2 | CO4 | PO11 |
| | (c) | L3 | CO4 | PO9 |
| **Q.9** | (a) | L3 | CO5 | PO5 |
| | (b) | L2 | CO5 | PO5 |
| | (c) | L3 | CO5 | PO5 |
| **Q.10** | (a) | L2 | CO5 | PO5 |
| | (b) | L2 | CO5 | PO5 |
| | (c) | L2 | CO5 | PO5 |

| **Bloom's Taxonomy Levels** | **Lower order thinking skills** | | |
|---|---|---|---|
| | Remembering ( knowledge): □ 1 | Understanding Comprehension) : □ 2 | Applying (Application): □ 3 |
| | **Higher order thinking skills** | | |
| | Analyzing (Analysis): □ 4 | Valuating (Evaluation): □ 5 | Creating (Synthesis): □ 6 |