

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH (A DEEMED TO BE UNIVERSITY)

M.Sc. Molecular Biology & Human Genetics (Semester-IV)

September 2021 Examination

Time: 3.00 Hrs.

[Max.Marks: 100]

Paper-II

Molecular Basis of Human Diseases II

Q.P Code: M4192

Your answers should be specific to the questions asked. Draw neat labelled diagrams wherever necessary.

LONG ESSAY

2 X 10 = 20 Marks

- 1. Explain the causes of non-Mendelian inheritance.
- 2. Explain the different types of dominance pattern.

SHORT ESSAY

10X 5 = 50 Marks

- 3. Distinguish between penetrance and expressivity with an example each.
- 4. Distinguish between monogenic and polygenic disease.
- 5. Describe the principle and purpose of genome-wide association study.
- 6. Explain the genetic basis of cystic Fibrosis.
- 7. Explain the genetic basis of Fragile X syndrome.
- 8. Describe the impact of vitamin K Epoxy reductase gene on warfarin dosage.
- 9. Explain the genetic basis of a musculoskeletal disorder.
- 10. Describe the genetic basis of Alzheimer's disease.
- 11. Describe the process of two-point gene mapping.
- 12. Describe the genetic basis of pharmacokinetic variation with an example.

SHORT NOTE

10 X 3 = 30 Marks

- 13. Describe the attributes of modifier gene with an example.
- 14. Distinguish between mosaicism and chimerism.
- 15. List any three enzymes associated with Phase-I metabolism.
- 16. Describe the sources of spontaneous mutation.
- 17. Describe the attributes of heritability.
- 18. Describe the attributes of map distance.
- 19. Describe the role of genetics in hearing loss.
- 20. List the objectives of Human Genome Project.
- 21. Describe the attributes of genetic marker.
- 22. Describe the attributes of candidate gene.

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Time: 3.00 Hrs.

[Max. Marks: 100]

Genetic Engineering & Biotechnology Q.P Code: M4201

Your answers should be specific to the questions asked.

Draw neat labelled diagrams wherever necessary

LONG ESSAY

2 X 10 = 20 Marks

1. Explain the preparation and applications of knockout mouse.

2. Explain the construction and applications of cDNA library.

SHORT ESSAY

10X 5 = 50 Marks

3. Explain the properties of PCR polymerases.

4. Explain the principle of directed protein evolution by error prone PCR.

5. Explain the biological significance of restriction-modification system in bacteria.

6. Explain the process of genome editing by using CRISPR technology.

7. Explain the mechanism of end-labelling by using polynucleotide kinase.

8. Explain the properties and applications of Bacterial Artificial Chromosome.

9. Explain the mechanism of action of trastuzumab.

10. List the properties of stem cells.

11. Explain the process of lead development in drug discovery.

12. Explain the mechanism of action of adalimumab.

SHORT NOTE

10 X 3 = 30 Marks

- 13. Describe the application of monoclonal antibodies in passive immunotherapy.
- 14. Describe the attributes of nanoparticles used in gene therapy.
- 15. List the DNA polymerases used in biotechnology.
- 16. Describe the genetic basis and application of blue-white screening assay.
- 17. Describe the different types of Intellectual Property Rights.
- 18. Define drug target.
- 19. Define protein biosimilar and give four examples
- 20. Describe the attributes of inclusion bodies in expression cloning.
- 21. Give three examples of model organisms used in genetic research.
- 22. List any three applications of proteins engineering.