SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

M.Sc. Molecular Biology & Human Genetics (M.Sc. MB & HG) First Year

(Semester - I) May 2022 Examinations

Time: 3 Hrs. [Max. Marks: 100]

Cell Biology

Q.P. Code: M1510

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

Long Essay **10 x 2 = 20 marks**

1. Explain the mechanism and types of transmembrane transport of molecules.
2. Describe the phases of meiosis. Distinguish between meiosis I and meiosis II.

Short Essay **5 x 10 = 50 marks**

3. Distinguish between a prokaryotic and eukaryotic cell. Explain the endosymbiotic theory.
4. Explain the structure, location and functions of ribosome.
5. Describe the structure and functions of centrosome.
6. Describe the structure and functions of nuclear pore complex.
7. Describe the structure and functions of flagella.
8. Describe their biological significance and give two examples.
9. Describe the attributes of signal transduction.
10. Explain the role of telomere in cell senescence.
11. Describe the classification of cell death.
12. Describe the attributes of protein sorting.

Short Notes **3 x 10 = 30 marks**

13. Describe the biological significance of ubiquitination.
14. Draw the schematic representation of the components of cell signalling pathway.
15. Describe the attributes of ion channel linked receptor.
16. Describe the role of protein phosphorylation during signal transduction.
17. Describe the attributes of second messenger.
18. Describe the attributes of cell quiescence.
19. Describe the attributes of inflammation.
20. Justify the statement: 'apoptosis is a type of programmed cell death'.
21. Describe the salient features of protein half-life.
22. Describe the salient features of protein domain.

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M.Sc. Molecular Biology & Human Genetics

First Year (Semester - I) May 2022 Examination

Time: 3 Hrs. [Max. Marks: 100]

Principles of Genetics

Q.P. Code: M1520

Your answers should be specific to the questions asked.

Draw neat labelled diagrams wherever necessary.

Long Essay **10 x 2 = 20 marks**

1. Explain the genetic basis of sex determination in human beings.
2. Define mutation and describe its classification.

Short Essay **5 x 10 = 50 marks**

3. State and explain the law of segregation with an example.
4. Explain gene flow, genetic drift and population stratification.
5. Describe the components of eukaryotic DNA replication.
6. Explain the steps involved in transcription.
7. Describe the salient features of mRNA processing
8. Describe the regulation of eukaryotic gene expression.
9. Explain the properties of eukaryotic genetic code.
10. Describe the structure of nucleosome.
11. Describe the salient features of gene family.
12. Describe the structure of DNA.

Short Notes **3 x 10 = 30 marks**

13. Describe the types of DNA repair pathways
14. Describe the salient features of transposons
15. Describe the salient features of ribozyme
16. Distinguish between pre-mRNA and mature mRNA
17. Describe the biological significance of protein misfolding
18. Describe the salient features of post-translational modifications of protein.
19. Describe the salient features of gene family.
20. Describe the biological significance of mitochondrial DNA
21. Describe the central dogma of molecular biology
22. Distinguish between homozygous, heterozygous and hemizygous conditions.

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M.Sc. Molecular Biology & Human Genetics
First Year (Semester-I) May 2022 Examination

Time: 3.00 Hrs | ANATOMY | [Max. Marks: 100]

Q.P. Code: M1530

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

LONG ESSAYS — 2x10=20 Marks

1. Describe the stomach under following headings a) Parts b) Relations c) Blood supply d) Lymphatic drainage e) Applied anatomy.(1+2+3+3+1)
2. Describe the Lungs under the following headings – a) Gross features b) Relations c) Blood supply d) Nerve supply. (3+4+2+1)

SHORT ESSAYS — 10X5=50 Marks

3. Describe the gross features, coverings and blood supply of Testis.
4. Describe the external and internal features of Right atrium.
5. Describe the formation, course area of drainage & termination of Thoracic duct.
6. Discuss briefly the process of Fertilization.
7. Illustrate the microscopic structure of Liver.
8. Describe the gross feature & microscopic structure of Pituitary gland.
9. Describe the blood supply of Supra renal gland.
10. Mention the formation of Circle of Willis.
11. Define connective tissue. Describe the contents of connective tissue
12. Discuss the supports of Uterus.

SHORT NOTES — 10X3=30 Marks

13. Name the ligaments of Spleen.
14. Illustrate the microscopic structure of Hyaline cartilage.
15. Name the parts of Pharynx.
16. List the tributaries of Coronary sinus.
17. Name the parts of Fallopian tube.
18. Illustrate the multipolar Neuron.
19. Name the cartilages of Larynx.
20. Name the contents of Middle ear.
21. Name the bones of Cell.
22. Name the cranial nerves in order.

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M.Sc. Molecular Biology & Human Genetics

First Year (Semester-I) May 2022 Examination

Time: 3.00 Hrs. **Biochemistry** **[Max. Marks: 100]**

Q.P. Code: M1540

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

Long Essay **2 x 10 = 20 marks**

1. Define oxidative phosphorylation. Explain the chemiosmotic theory of oxidative phosphorylation (5 + 5)
2. Describe the various types of enzyme inhibition with graphs. List any three practical uses of enzyme inhibitors in medicine. (7+3)

Short Essay **10 x 5 = 50 marks**

3. Explain the structures of all the different types of deoxyribo nucleic acids.
4. Define mutarotation. Mention the cause and clinical significance of mutarotation. (2+1+2)
5. List and describe the biological functions of proteins.
6. Describe ketone bodies with example. Add a note on ketosis. (2 + 1 + 2)
7. Define plasmalogens. Give the composition of plasmalogens and mention their functions. (2 + 1 + 2)
8. Explain the functions of molecular chaperons
9. Describe the structure of tRNA with a labelled diagram. Mention the unusual bases in tRNA. (2+2+1)
10. List the different bile salts. Explain their role in lipid digestion and deficiency manifestations of bile salts. (1+2+2)
11. Enumerate high energy phosphate compounds. Write the differences between oxidative. phosphorylation and substrate level phosphorylation with examples.(2+3)
12. Define vitamins. Classify vitamins based on their solubility. (2 + 3)

Short Answers **10 x 3 = 30 marks**

13. Define the terms refraction, absorption and reflection.
14. Mention the three causes of metabolic and respiratory acidosis.
15. List the properties and functions of buffers.
16. Illustrate the role of vitamin K in blood clotting.
17. Describe Henderson Hasselbach equation.
18. Differentiate between primary, secondary and tertiary structures of protein.
19. Define glycoproteins. Give two examples with its biological functions. (1 + 2)
20. Define Isoelectric pH. Mention its significance. (1 + 2)
21. Define RNA. List the general functions. (1 + 2)
22. Describe RCF.

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