



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

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

**March 2024 Examination**

**Time : 3 Hrs.**

**[Max. Marks :100]**

**Medical Genetics**

**Q.P Code : M3580**

*Your answers should be specific to the questions asked.*

*Draw neat labelled diagrams wherever necessary.*

**Long Essay**

**2X20=40 Marks**

1. Describe the principle of FISH, types and applications of FISH in genetics testing with suitable examples
2. Define monogenic and polygenic chromosomal disorders, and explain the indications for genetic testing

**Short Essay**

**6X10=60 Marks**

3. Define monosomy and trisomy, and describe the monosomy and trisomy of sex chromosomes
4. Explain the salient features of ISCN classification
5. Define translocation, types of translocations suitable example
6. Define conventional genetic cytogenetic testing and describe Q and C banding
7. Define cell free DNA and the use of cell free DNA for non-invasive test for prenatal diagnosis
8. Define Philadelphia chromosome and describe the purpose of evaluating Philadelphia chromosome



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**Molecular Biology Techniques**

**Q.P Code : M3590**

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**Long Essay**

**2X20=40 Marks**

1. Explain the principles of polymerase chain reaction.
2. Define chromatography. Explain the principles of different chromatography techniques used for protein purification.

**Short Essay**

**6X10=60 Marks**

3. Explain the principle of HPLC. Describe the advantages of HPLC over conventional liquid chromatography.
4. Describe the general properties of PCR primer.
5. Explain the principle and applications of density gradient centrifugation.
6. Explain the principle and applications of multiplex ligation dependent probe amplification technique (MLPA).
7. Explain the principle of TaqMan method of real-time polymerase chain reaction.
8. Distinguish between Whole Genome Sequencing, Whole Exome Sequencing and Clinical Exome Sequencing.



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**Research Methodology and Biostatistics**

**Q.P Code: M3600**

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**LONG ESSAY**

**20 = 40 Marks**

1. Explain the salient features of Good Laboratory and clinical Practices
2. a) What is sampling? Classify sampling methods  
b) In a nutritional study following results were observed? Is the difference in mean body weight significant? (Z critical value 1.96)

Group	Mean	Standard Deviation
Experimental Group	30	2
Control Group	29	1.8

**SHORT ESSAY**

**6X 10 = 60 Marks**

3. Explain the importance of hypothesis in research. Distinguish between hypothesis and null hypothesis
4. Explain the significance of bibliography in scientific literature
5. Describe the features of Declaration of Helsinki
6. Define mean, median and mode with advantages and disadvantages. Compute the mean and median for the following data of weigh of children admitted in Anganwadi Centre.  
Weight in Kg: 16, 11, 8, 10, 14, 16, 9, 9, 13 and 12.
7. Define chi-square test. Write the procedure for application of chi-square test.
8. Define correlation. Explain types of correlation with examples

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