**ST. JOSEPH’S UNIVERSITY, BENGALURU -27**

Registration Number:

Date & session:6-12-22

**M.Sc (ZOOLOGY) – I SEMESTER**

**SEMESTER EXAMINATION: OCTOBER 2022**

**(Examination conducted in December 2022)**

**ZO7222 – ADVANCED CELL BIOLOGY AND GENETICS**

**Time: 2 Hours Max Marks: 50**

**This paper contains two printed pages and four parts**

**Note: Draw diagrams wherever necessary**

**Part - A**

**I. Answer the following. 5X1=5**

1. \_\_\_\_\_\_\_\_\_\_ is the storage site for calcium.
2. A Hybrid having a genotype RrTt is crossed with a genotype rrtt, the phenotypic ratio of the offspring will be \_\_\_\_\_\_\_\_\_\_.
3. Lysosomal membrane proteins transport is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** dependent**.**
4. In a family of four including a normal mother, a normal father, a colour-blind son and a normal son; who do you think has the defective gene other than the affected son?
5. Sex determination in the grasshopper is by the XO method. The somatic cells of a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_grasshopper is analyzed and found to contain 19 chromosomes.

**Part - B**

**II. Answer the following questions. 5X2=10**

1. Define Glycocalyx.
2. In ABO blood group system is humans, if the parents have type- AB and type-B, what blood type could their children have?
3. List out the modification of protein through which protein sorting takes place in Golgi apparatus.
4. Name the transmembrane adhesion proteins that forms tight junctions.

**10.** Define test cross with an example.

**Part - C**

**III. Answer any Three of the following questions. 3X5=15**

**11.** List the characteristics of autosomal recessive trait.

**12.** What is Linkage? Mention its types with suitable examples.

**13.** Describe the mitochondria- mediated pathway of apoptosis.

**14.** Define Epistasis with an example.

**Part – D**

**IV. Answer any Two of the following questions. 2X10=20**

**15.** Elucidate the mechanism of signal transduction by G Protein-Coupled receptor with a

neat labelled diagram.

**16.** Chickens that carry both the alleles for rose comb (R) and pea comb (P) have walnut

comb. Whereas, chicken that lack both the alleles that is they are genotypically rrpp have

single comb. From, this information about the interactions between the two genes,

determine the phenotypes and proportions expected from the following cross:

a. RRPp X rrPp b. rrPP X RrPp c. RrPp x Rrpp d. Rrpp X rrpp

**17.** Why is p53 gene described as the “guardian of the genome”?