

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2025

B.Tech-VII Semester (BT)

COURSE CODE (CREDITS): 18B11BT311 (3-1-0)

MAX. MARKS: 35

COURSE NAME: Genetics

COURSE INSTRUCTORS: Dr Sudhir Syal/ Dr Tyson

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Early insect embryos rely on localized maternal factors for body axis formation. How these factors help establish the anterior-posterior pattern in <i>Drosophila</i> .	II	4
Q2	Early amphibian embryos undergo large-scale cell movements that rearrange the blastula into organized germ layers. What major morphogenetic process drives this transformation during amphibian gastrulation?	II	4
Q3	In organs like the mammalian liver, functional mass can return without recreating lost anatomy. What cellular response supports this type of regeneration?	II	4
Q4	Developing limb buds rely on coordinated signals that establish their major axes and overall pattern. What key interactions occur for proper formation of a tetrapod limb?	II	5
Q5	Mammalian fertilization involves several sequential interactions between the sperm and the egg before fusion can occur. What key cellular events allow a sperm cell to successfully penetrate and fertilize the mammalian oocyte?	II	5
Q6	Compare the cleavage patterns in mammals and amphibians discussing how the amount and distribution of yolk influences the process.	II	3
Q7	a) If two black mice are crossed, ten black and three white mice results i) Which alleles are dominant? ii) Which alleles are recessive? iii) What are the genotypes of parents? b) How does a person be genetically with type B blood group, but functionally type O?	III	2.5+2.5
Q8	a) Illustrate an example of gene interaction contrast to Mendelian Genetics. b) Why did Mendel choose pea plants instead of other species, and how might his results have differed with animals? c) How did Mendel's mathematical background influence the way he analyzed biological data?	I	2+2+1