

10/10/2025 12:17 PM (90)

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-III Semester (BT)

COURSE CODE (CREDITS): 25B11BT312 (3-1-0)

MAX. MARKS: 15

COURSE NAME: GENETICS AND DEVELOPMENTAL BIOLOGY

COURSE INSTRUCTORS: Dr Sudhir Syal / Dr Tyson

MAX. TIME: 1 Hour

**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	a) In a family of six children, what is the probability of obtaining the following distribution of boys and girls? (Show your work, calculations). i) All boys ii) All children of the same sex iii) four girls and two boys iv) four boys and two girls b) A Chi-square test comparing observed and expected numbers of progeny is carried out, and the probability associated with the calculated Chi-square value is 0.80. What does this probability represent?	III	[2+1]
Q2	a) If a genetic counselor finds that a disorder has 70% penetrance, how should this information be conveyed to a family with a history of disease? b) How can a variable expressivity complicate the diagnosis and prognosis of a genetic disorder? c) A women with blood group 'O' has a child with blood group 'B'. She claims that a man with blood group 'AB' is the father. Using pedigree logic, is her claim possible?	I & III	[1+1+1]
Q3.	Give reason for the following a) Polar bodies are formed during oogenesis but not during spermatogenesis. b) Oocytes remain arrested for long durations, unlike sperm cells which are produced continuously. c) Capacitation of sperm is essential before fertilization in mammals. d) Cleavage divisions lack growth phases (G1 and G2). e) Primitive streak is considered the hallmark of chick gastrulation.	II	[5x1]
Q4.	Sea urchins undergo external fertilization while mammals undergo internal fertilization. How does this difference influence the strategies of sperm and egg interaction?	II	[3]
Q5.	Explain the role of the cortical reaction in preventing polyspermy during mammalian fertilization.	II	[1]