JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-III Semester (BT)

COURSE CODE (CREDITS): 25B11BT312 (3-1-0) MAX. MARKS: 15

COURSE NAME: GENETICS AND DEVELOPMENTAL BIOLOGY

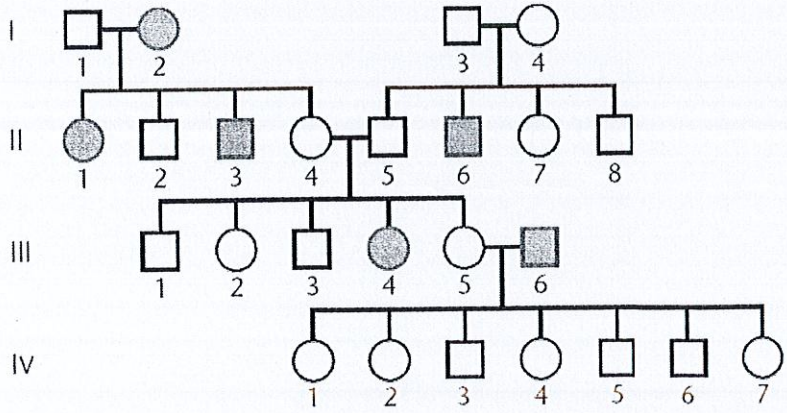
COURSE INSTRUCTOR: Prof. Sudhir Syal / Dr Tyson MAX. TIME: 1 Hour

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Note: *(a) All questions are compulsory.*

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

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	a) In cats, black coat color is dominant over gray. A female black cat whose mother is gray mates with a gray male. If this female has a litter of six kittens, what is the probability that three will be black and three will be gray? b) Hemophilia (reduced blood clotting) is an X-linked recessive disease in humans. A woman with hemophilia mates with a man who exhibits normal blood clotting. What is the probability that their child will have hemophilia?	I	1.5+1.5
Q2	a) In the following pedigree; predict the probable mode of inheritance with logical reasoning and genotypes of each individual. Assume that genes D and d control the expression.  	III	3

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Q3	**State the reasons of the following.** a) Early embryonic cleavage in animals characterized by an absence of growth phases (G 1 and G 2)? b) Cortical reaction renders the zona pellucida impenetrable after sperm entry? c) Discoblastula form in telolecithal eggs instead of a hollow coeloblastula? d) Human implantation requires syncytiotrophoblast formation rather than cytotrophoblast alone? e) Blastocyst of mammals considered a modified blastula, unlike the typical coeloblastula seen in amphibians? f) Primary oocytes arrested at the diplotene stage of prophase I for years in human females.	II	1X6=6
Q4	During the first two weeks after fertilization in mammals, the developing embryo undergoes several important changes. What are the major developmental events that characterize this early embryonic period?	II	2
Q5	Gametogenesis involves the formation and maturation of male and female gametes. Differentiate between oogenesis and spermatogenesis.	II	1