

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-1 EXAMINATION, FEBRUARY 2016

B.Tech II Semester (BT)

10B11BT411

Subject Code: 10B11BT312

Subject Name: Genetics

Course Credits: 04

Maximum Marks: 15

Time: 1Hr.

Attempt all questions. All parts of each question have to be answered in one place. Carrying of mobile phone in examination centre will be treated as unfair means case. Calculator is allowed.

Q1: a) A woman has a rare abnormality of the eye lids called ptosis (autosomal dominant inheritance), which prevents her from opening her eyes completely. This condition is caused by a dominant allele, P. The woman's father had ptosis, but her mother had normal eye lids. Her father's mother had normal eye lids. i) What are the genotypes of the woman, her father, and her mother? ii) What proportion of the woman's children will have ptosis if she marries a man with normal eye lids (Show your work).

b) A cell has four pairs of homologous chromosomes designated Aa, Bb, Cc, Dd, where 'A' and 'a' represent a pair of homologs. How many different kinds of gametes can this cell produce and why? [2+1]

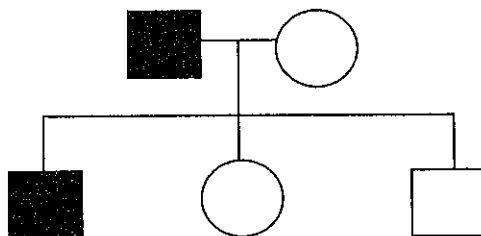
Q2: a) If both husband and wife are known to be carriers of the allele for albinism, what is the chance of following combinations in a family of four children:- i) all four unaffected ii) two unaffected and two affected. (Show your work).

b) Would greater genetic variability be expected among asexually reproducing organisms, self-fertilizing organisms, or bisexual organisms? Explain. [2+1]

Q3: a) In sweet peas, genes C or P alone produce white flowers, the purple color being due to the presence of both these factors. Write down the genotypes and phenotypes of each offspring of the cross:- CcPp X ccPp.

b) In Drosophila, an X- linked recessive mutation, scalloped (sd), causes irregular wing margins. Diagram the F₁ results if a scalloped female is crossed with a normal male. [2+1]

Q4: Consider the pedigree shown here:- of the four combinations of X-linked recessive, X- linked dominant, autosomal recessive, and autosomal dominant, which modes of inheritance can be absolutely ruled out in each case and why? (Show your work). [3]



Q5: a) Mendel crossed peas having wrinkled green seeds with peas having round yellow seeds. All F₁ had seeds that are round and yellow. Predict the results of test crossing these F₁ plants.

b) Explain that Pattern Baldness in humans is sex-influenced inheritance.

[1.5 each]