JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
SUMMER SEMESTER (JULY 2016) - B-Tech Biotechnology
END TERM EXAM

COURSE CODE: 10BIIBT411   MAX. MARKS: 50

COURSE NAME: GENETICS   MAX.TIME: 2 HRS

COURSE CREDITS: 4

Q.1   7x4=28

A. What is significance of mutations? What do understand by following terms with respect to mutations i) somatic ii) spontaneous iii) transversions iv) frame shift

B. What are mutagens? Enlist their main categories. Explain molecular basis of mutations caused by following mutagens. a)Alkylating agents b) 5 bromouracil c) ionizing radiations d) non ionizing radiations

C. Describe the Ames test used for screening chemicals for mutagenicity.

D. What do you understand by extra nuclear inheritance? Cite and discuss any two examples of cytoplasmic inheritance

Q.2   3x4=12

a. Color blindness in human is due to sex linked recessive gene. A survey of 500 men from a population revealed that 20 were color blind. i) What the frequency of normal allele in the population. ii) What percentage of the females is this population is expected to be free of the disease?

b. Human being carrying a dominant allele T can taste phenyl thiocarbamide (PTC). In a population the frequency of non tasters phenotype is 0.36. Calculate the frequency of tasters which are i) Homozygous ii) Heterozygous

c. Following data for MN blood type was obtained for a population. M=119, MN=76, N=13. Calculate frequency of L^m and L^n alleles.

d. In a large population that produces by random mating, the frequency of genotypes GG, Gg and gg are 0.04, 0.32, and 0.64 respectively. Change in the climate induces the population to reproduce exclusively by self fertilization predict the frequency of the genotypes in this population after many generation of self fertilization (take inbreeding coefficient F=1).

Q.3 The frequency of I^A I^B and i genes which governs the blood group of human being is given as I^A =0.36, I^B=0.20, i=.44. Calculate the percentage of population expected to be of groups A, B, AB and O.   4

Q.4 A population of Hawaiian Drosophila is segregating two alleles P^1 and P^2 of phosphoglucose isomerase (PGI) gene. In a sample of 100 flies from this population, 30 were P^1P^1 homozygote, 60 were P^1P^2 heterozygote and 10 were P^2P^2 homozygote. Perform chi square test to determine if the genotypes are in Hardy Weinberg proportions. Given χ^2 for 1 df = 3.841   6