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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID SEMESTER EXAMINATION-2015

B.Tech II Semester

COURSE CODE: 10B11BT411　　　　　　　　　　　　　MAX. MARKS: 30

COURSE NAME: GENETICS

COURSE CREDITS: 04　　　　　　　　　　　　　　　　MAX. TIME: 2 HRS

Note: *All questions are compulsory.*

Section A　　　　　　　　　　　(Marks: 6)

1. How are genes "passed" from generation to generation?
2. A diploid species where 2n=28 will produce gametes with how many chromosomes and what would be the combinations in the gamete formation?
3. Explain the molecular mechanism involved in termination of metaphase stage.
4. Why do we not say that homologous chromosomes are two copies of the same chromosome?
5. What is a karyotype and which stage of cell division is suitable for the preparation of karyotypes?
6. Humans have 23 pairs of chromosomes. Ignoring the effects of crossing over, what proportion of a woman's eggs contains only chromosomes she received from her mother?

Section B　　　　　　　　　　　(Marks: 9)

1. In humans, why are X-linked recessive traits more likely to occur in males compared to females?
2. At three points during meiosis, events occur that will lead to gametes that differ from each other. Describe these three events.
3. A woman with AB blood gave birth to a baby, also with type B blood group. Two different men claim to be father. One has type A blood, the other type B blood. Can the genetic evidence decide in favor of either?

Section C　　　　　　　　　　　(Marks: 15)

1. How might Mendel's results and the model he formulated have been different if the traits he chose to study were governed by alleles exhibiting incomplete dominance or codominance?

2. Mendel test crossed pea plants grown from yellow, round F1 seeds to plants grown from green, wrinkled seeds and obtained the following results: 31 yellow round; 26 green round; 27 yellow wrinkled; 26 green wrinkled. Are these results consistent with the

hypothesis that sed color and seed texture are controlled by independently assorting genes, each segregating two alleles.

3. Chickens that carry both the alleles for Rose comb and pea comb have walnut combs, whereas chickens that lack both of these alleles have single combs. From the information about interactions of the gene, determine the phenotypes and proportions expected from the following crosses: (a) RrPp X Rrpp ; (b) Rrpp X rrpp

Table 4-1 Critical Values of the χ^2 Distribution

				P						
df	0.995	0.975	0.9	0.5	0.1	0.05	0.025	0.01	0.005	df
1	.000	.000	0.016	0.455	2.706	3.841	5.024	6.635	7.879	1
2	0.010	0.051	0.211	1.386	4.605	5.991	7.378	9.210	10.597	2
3	0.072	0.216	0.584	2.366	6.251	7.815	9.348	11.345	12.838	3
4	0.207	0.484	1.064	3.357	7.779	9.488	11.143	13.277	14.860	4
5	0.412	0.831	1.610	4.351	9.236	11.070	12.832	15.086	16.750	5
6	0.676	1.237	2.204	5.348	10.645	12.592	14.449	16.812	18.548	6
7	0.989	1.690	2.833	6.346	12.017	14.067	16.013	18.475	20.278	7
8	1.344	2.180	3.490	7.344	13.362	15.507	17.535	20.090	21.955	8