UNIVERSITY OF THE PUNJAB

B.A. / B.Sc. Part – I Annual Exam – 2019

Subject: Genetics-I **Paper: A (Principles of Geneties)** **Time: 30 Min. Marks: 14**

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

Attempt this Paper on this Question Sheet only.
Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Fill in the blanks with appropriate words. (7)

i. The division of cytoplasm resulting in two cells from one original cell is termed as _____.

ii. In Cannabis the treatment with _____ promotes the production of female flower.

iii. An allele is one of the several form of a _____.

iv. In male honey bee (Drones) the number of chromosome is only half _____ as compared to the female honey bee.

v. _____ is a diploid cell missing a single chromosome.

vi. _____ is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis.

vii. _____ is a mapping technique in which bacterial conjugation is disrupted after specified time intervals.

Q.2. Write (T) in front of true statement and (F) in front of false statement. (7)
And if some statement is false then correct it.

i. Hypostasis is the interaction between non-allelic genes in which one gene inhibits or suppresses the expression of the other gene.

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_____

P.T.O.

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B.A. / B.Sc. Part – I Annual Exam – 2019

Roll No. .....

Subject: Genetics-I **Paper: B (Biometry and Quantitative Genetics)** **Time: 2 Hrs.** **Marks: 21**

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any THREE questions. All questions carry equal marks. Draw neat and labeled diagrams along with captions where necessary.

Q-3 (A) What are "Quantitative variable" and describe its different types. — 04

(B) The following table shows the frequency distribution of the diameters (in millimeters) of 500 bottles. Find the **Mode** of the data. — 03

Diameter	35-39	40-44	45-49	50-54	55-60
Frequency	65	135	155	100	45

Q-4 (A) What are different measures of central tendency? Write their advantages and when each is used? — 04

(B) In hospital, the number of patients diagnosed with disease are as below, by age group. — 03

Age	20–29	30–39	40–49	50–59	60–69	70–79	80–89
Frequency	14	50	145	128	43	25	8

Calculate the Mean age and its Standard deviation.

Q-5 (A) What is use of Chi-square test? Differentiate between Chi-square Goodness of fit and Chi-square Test of associations? — 03

(B) A cross was made to produce D. melanogaster flies heterozygous for two pairs of alleles: *dp+* and *dp*, which determine long versus short wings, and *e+* and *e*, which determine grey versus ebony body color. The following F_2 data were obtained: — 04

Phenotype	**Number**
Long wing, grey body	458
Long wing, ebony body	171
Short wing, grey body	142
Short wing, ebony body	51

Test these data for agreement with the 9: 3: 3: 1 ratio expected if the two pairs of alleles segregate independently.

Q-6 (A) In a population of mice, there are two alleles of the A locus (A1 and A2). Tests showed that in this population there are 382 mice of genotype *AA*, 212 of *Aa*, and 262 of *aa*. What are the frequencies of the two alleles in the population? — 04

(B) Describe the factors that cause genetic variation in populations? — 03

Q-7 (A) Write notes on — 04

a) Inbreeding
b) Polygenic inheritance

(B) What is the probability of rolling a six-sided dice and obtaining the following numbers? — 03

(a) 1 OR 4
(b) An even number OR number less than 5
(c) Any odd number OR number greater than 3

P.T.O.

Table A2.5 Values of the statistic χ^2.

d.f.	Probability of exceeding the critical value				
	0.10	0.05	0.025	0.01	0.001
1	2.706	3.841	5.024	6.635	10.828
2	4.605	5.991	7.378	9.210	13.816
3	6.251	7.815	9.348	11.345	16.266
4	7.779	9.488	11.143	13.277	18.467
5	9.236	11.070	12.833	15.086	20.515
6	10.645	12.592	14.449	16.812	22.458
7	12.017	14.067	16.013	18.475	24.322
8	13.362	15.507	17.535	20.090	26.125
9	14.684	16.919	19.023	21.666	27.877
10	15.987	18.307	20.483	23.209	29.588
11	17.275	19.675	21.920	24.725	31.264
12	18.549	21.026	23.337	26.217	32.910
13	19.812	22.362	24.736	27.688	34.528
14	21.064	23.685	26.119	29.141	36.123
15	22.307	24.996	27.488	30.578	37.697
16	23.542	26.296	28.845	32.000	39.252
17	24.769	27.587	30.191	33.409	40.790
18	25.989	28.869	31.526	34.805	42.312
19	27.204	30.144	32.852	36.191	43.820
20	28.412	31.410	34.170	37.566	45.315
21	29.615	32.671	35.479	38.932	46.797
22	30.813	33.924	36.781	40.289	48.268
23	32.007	35.172	38.076	41.638	49.728
24	33.196	36.415	39.364	42.980	51.179
25	34.382	37.652	40.646	44.314	52.620
26	35.563	38.885	41.923	45.642	54.052
27	36.741	40.113	43.195	46.963	55.476
28	37.916	41.337	44.461	48.278	56.892
29	39.087	42.557	45.722	49.588	58.301
30	40.256	43.773	46.979	50.892	59.703
35	46.059	49.802	53.203	57.342	66.619
40	51.805	55.758	59.342	63.691	73.402
45	57.505	61.656	65.410	69.957	80.077
50	63.167	67.505	71.420	76.154	86.661
60	74.397	79.082	83.298	88.379	99.607
70	85.527	90.531	95.023	100.425	112.317
80	96.578	101.879	106.629	112.329	124.839
90	107.565	113.145	118.136	124.116	137.208
100	118.498	124.342	129.561	135.807	149.449