M. SC. (Microbiology) SEM-II (C.B.C.S.) (2012 COURSE) : WINTER - 2018

SUBJECT: QUANTITATIVE BIOLOGY

Day : Friday
Date : 12/10/2018

W-2018-1026

Time : 03.00 PM TO 06.00 PM
Max. Marks: 60.

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the **RIGHT** indicate full marks.
3) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 What is Epistasis? What are the different modified ratios arising in the progeny due to epistasis. Explain with examples. **(15)**

OR

a) Explain in detail hypothesis testing and error in testing hypothesis. **(08)**

b) A Pharmaceutical Company claims to develop a drug, which increases hemoglobin content (g/100 ml). Hemoglobin content of 10 subjects is measured before and after administration of the drug as given below. Test whether company's claim is valid (t_{crit}=2.26). **(07)**

Subject	1	2	3	4	5	6	7	8	9	10
Hb before	10	9	11	12	8	7	12	18	10	9
Hb after	12	11	13	14	9	10	12	14	11	12

Q.2 **a)** Explain the concept of incomplete dominance with suitable examples. **(08)**

b) Calculate the standard deviation and standard error of mean for following data: **(07)**

5, 7, 8, 4, 7, 6, 9, 8

Q.3 Attempt any **THREE** of the following: **(15)**

a) Differentiate between the behaviour of autosomal dominant and autosomal recessive traits.

b) Why are Mendel's contributions important? Give its significance.

c) Determine the correlation coefficient for the following data:

X	1	2	3	4	5	6
Y	3	5	11	13	14	20

d) In F_2 generation, Mendel obtained 621 tall plants and 181 dwarf plants. Test whether the two types of plants are in accordance with the Monohybrid ratio i.e. 3:1.

Q.4 Write short note on/ Solve the given problem (Any **THREE**) **(15)**

a) Gene interaction

b) Histogram construction

c) The L^M and L^N alleles at the MN blood-group locus exhibit codominance. give the expected genotypes and phenotypes and their ratios in progeny resulting from the following crosses:

(i) $L^ML^M \times L^ML^N$ (ii) $L^NL^N \times L^NL^N$

(iii) $L^ML^N \times L^ML^N$ (iv) $L^ML^N \times L^NL^N$

(v) $L^ML^M \times L^NL^N$

d) Poisson distribution

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