

U.C. 6th Semester Examination-2023

BOTANY
(HONOURS)

Course Code : BOT-H-CC-T-13
(Genetics)

Full Marks : 40

Time : 2½ Hours

be figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any five of the following questions: 2×5=10

- a) Differentiate between polygenic and monogenic traits.
- b) Define recessive epistasis.
- c) What type of mutation is Robertsonian translocation?
- d) Distinguish between inducible gene regulation and Repressible gene regulation.
- e) What is Shine Dalgarno sequence? What role does it play during protein synthesis?
- f) Mention the role of sigma factor in transcription initiation.

[Turn Over]

e) Discuss how genetic code was deciphered?
Explain the degeneracy of genetic code. 5+5=10

d) An F1 individual heterozygous of A, B and C genes was test crossed and the following progenies were obtained —

- ABC / abc = 370
- abc / abc = 385
- ABc / abc = 45
- aBc / abc = 50
- ABc / abc = 2
- abc / abc = 3
- Abc / abc = 75
- abC / abc = 70

Construct the linkage map showing correct order of loci and map distance in between them, along with coefficient of correlation and interference. 6+2+2=10

g) What are linker histones?

h) A hemophilic woman has a mother who phenotypically normal. Mention the genotype of parents of the woman?

2. Answer any two of the following questions: 5×2=

a) What is incomplete dominance? Explain phenomenon with *Mirabilis jalapa* as example. 1+4

b) Illustrate Multiple Alleles with ABO blood group as an example.

c) Explain the meiotic behavior of inverted heterozygote.

d) Describe the detection of mutation by method.

3. Answer any two of the following questions: 10×2=

a) Define attenuation. Describe the mechanism of regulation of tryptophan synthesis in *E. coli*. 2+8

b) What are Okazaki fragments? Discuss the role of various proteins that assemble at replication fork during prokaryotic DNA replication. 2+8