

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted from the academic year 2011 – 12 & thereafter)
SUBJECT CODE: 11BT/MC/GG64

B.Sc. DEGREE EXAMINATION, APRIL 2016
BRANCH V(A) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SIXTH SEMESTER

COURSE : MAJOR – CORE
PAPER : GENETICS AND GENETIC ENGINEERING
TIME : 3 HOURS **MAX. MARKS: 100**

SECTION –A

ANSWER ALL THE QUESTIONS

I. CHOOSE THE CORRECT ANSWER: **(1 x 5 = 5)**

1. Crossing over during meiosis occurs in
a) Leptotene b) Zygotene
c) Pachytene d) Diplotene
2. *Bam HI* and *Eco RI* are the types of
a) Restriction endooxidase b) Restriction endonuclease
c) Restriction exonuclease d) Restriction polymerase
3. *Agrobacterium rhizogenes* causes
a) Crown gall disease b) Club root disease
c) Hairy root disease d) All of the above
4. The law of segregation was rediscovered by
a) Devries b) Correns c) Tschermak d) All of the above
5. *Bt* toxin gene in cotton is
a) Resistant to caterpillar b) Resistant to drought
c) Resistant to microbes d) Resistant to insect pest

II. FILL IN THE BLANKS: **(1 x 5 = 5)**

6. The principle of segregation was formulated by Mendel in _____
7. In *Ti* plasmid T-DNA is responsible for _____ induction.
8. Extra chromosomal hereditary determinants are known as _____
9. *Bacillus thuringiensis* commonly known as *Bt* is a gram positive _____
10. The plasmid which carries a foreign DNA molecule of known sequence is called _____

III. STATE WHETHER TRUE OR FALSE: **(1 x 4 = 4)**

11. Human blood groups are determined by single gene
12. Cytoplasmic inheritance is also known as maternal inheritance
13. Plasmids that can integrate into the bacterial DNA is called episome
14. Direct DNA uptake by protoplasts can be stimulated by PEG

IV. MATCH THE FOLLOWING: **(1 x 4 = 4)**

- | | |
|----------------------------|---------------------|
| 15. Punnett square | Hugo devries |
| 16. Mutation | Reginald C. Punnett |
| 17. Tomato | Dihybrid cross |
| 18. Independent assortment | Flavr savr |

V. ANSWER ANY SIX OF THE FOLLOWING, EACH ANSWER NOT EXCEEDING 50 WORDS: (6 x 3 =18)

19. *Ti* plasmid
20. YAC
21. Linkage
22. GM plants
23. Sex determination in *Drosophila*
24. Co-dominance
25. Multiple alleles
26. Gene Libraries
27. PEG

SECTION –B

VI. ANSWER ANY FOUR OF THE FOLLOWING, EACH ANSWER NOT EXCEEDING 200 WORDS: (4 x 6 =24)

28. What are complementary genes? Explain their inheritance with the help of a cross.
29. Discuss the salient features of the mechanism of crossing over.
30. Give an account of restriction endonucleases.
31. Describe the structure of YAC vector.
32. What is golden rice? Bring out the salient features of golden rice.
33. What is cytoplasmic inheritance? Explain it with two suitable examples.

SECTION –C

VII. ANSWER ANY TWO OF THE FOLLOWING, EACH ANSWER NOT EXCEEDING 1000 WORDS: (2 x 20 =40)

34. Describe the mechanism of inheritance of ABO system of blood groups, highlighting the principle of genetics involved in it.
35. Write an essay on sex linked inheritance in man with reference to haemophilia and colour blindness.
36. Describe the various physical techniques utilised for introducing foreign DNA into plant cells
37. Describe the technique of southern blotting
