

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086

(For candidates admitted from the academic year 2011 - 12)

SUBJECT CODE: 11BT/MC/GG64

B.Sc. DEGREE EXAMINATION, APRIL 2014

**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. One F₁ hybrid obtained from a cross between red flowered (RR) pea variety and white flowered (rr) pea variety was selfed. Choose the phenotype ratios of progenies obtained due to selfing.
(a) 1 red : 1 white (b) 3 red : 1 white
(c) All are white (d) All are red
2. The common name of the insect resistance transgenic cotton plant is
(a) Bollguard (b) Yield guard
(c) BXN (d) Roundup ready
3. The coupling test cross ratio is
(a) 1:7:7:1 (b) 1:1:1:1 (c) 7:1:1:7 (d) 9:3:3:1
4. The most commonly used restriction endonuclease in gene cloning is
(a) Type I (b) Type II (c) Type III (d) Type IV
5. Agro bacterium rhizogenes induces
(a) Hairy root disease (b) Crown gall disease
(c) Root canker disease (d) Tuberous root disease

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

6. Linkers and adapters are _____ short double stranded DNA molecules.
7. In Ti plasmid the T-DNA region has the genes for biosynthesis of auxin, cytokinin and opine are referred to as _____.
8. To overcome Vitamin A deficiency it was proposed to genetically manipulate rice to produce β -carotone in the _____.
9. The suppressed character which does not appear in first filial generation is called _____.
10. The gene for red green colour blindness is located on _____.

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

11. Yeast artificial chromosome is a synthetic DNA that can accept large fragments of foreign DNA.

12. *Agrobacterium tumefaciens* is a soil borne gram-negative bacterium.
13. The unit of genetic map is centimorgan.
14. The term Allele was coined by Bateson and Saunders (1902) for characters which are contrasting or differing from one another.

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

- | | | |
|---------------------------|---|------------------------|
| 15. Western blotting | - | Physical gene transfer |
| 16. Crossing over | - | Recessive character |
| 17. Silicon carbide fibre | - | Evolutions |
| 18. Hemophilia | - | Protein |

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

19. Recombinant DNA.
20. BAC.
21. Microinjection.
22. T DNA.
23. Colour blindness.
24. Golden Rice.
25. Linked genes.
26. Biolistics.
27. Reciprocal crosses.

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

28. What are the applications of Southern blotting?
29. Describe the gene transfer by electroporation technique.
30. What are the ultimate goals of genetically modified crop plants?
31. Discuss the sex determination in humans.
32. Briefly discuss the different theories of chiasma formation.
33. What does the gene interaction mean? Explain the inhibitory factory with an example.

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

34. Write an essay on molecular tools of genetic engineering.
35. Give an account of Transgenic crop plants.
36. Describe the *Agrobacterium* mediated gene transfer technique.
37. What is sex linked inheritance? Explain with sex linked characters of colour blindness and Haemophilia.
