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 2015
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. Mendel was fortunate in choosing a diploid plant because diploid organisms contain
   a) a set of chromosomes b) more than two sets of chromosomes
   c) two sets of chromosomes d) a pair of chromosomes.
2. The cut DNA fragments are covalently joined together by.
   a) DNA polymerases b) RNA polymerases c) DNA ligases d) RNA ligases
3. Crossing over brings about.
   a) recombination of genes b) complete linkage
   c) cytoplasmic reorganisation d) no significant change.
4. Which of the following is a genetic vector
   a) plasmid b) phage c) cosmid d) all of these
5. Cry proteins are also referred to as
   a) simple proteins b) secondary proteins c) tertiary proteins d) Bt proteins

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

6. Western blotting involves the identification of _____.
7. The collection of DNA fragments from a particular species represents _____.
8. The sex chromosome is discovered by _____.
9. When more than two different forms of a given gene exist in a species they are referred to as _____.
10. Bt toxins are rapidly _____ in the environment.

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

11. Sex linked characters are recessive
12. Vectors are RNA molecules which can carry a foreign DNA fragment to be cloned.
13. Electroporation is a technique involving electronic field mediated membrane permeabilisation.
14. *Bacillus thuringiensis* is a gram negative soil bacterium.

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

15. YAC	(a) sex linked disease
16. Duchne muscular dystrophy	(b) progeny
17. Recessive alleles	(c) synthetic DNA
18. Filial	(d) homozygous individuals

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

19. Double crossing over
20. Genic balance theory
21. Ti plasmids
22. Incomplete dominance
23. Test cross
24. c DNA library
25. Bt cotton
26. PEG
27. Golden rice

SECTION –B

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

28. Explain Mendel's law of segregation with an example.
29. Give an account of blood group inheritance in man.
30. What is sex determination? Describe the phenomenon by considering the example of human beings.
31. Explain *Agrobacterium* mediated gene transfer.
32. Give an account of provitamin A enriched rice.
33. Write a note on restriction endonucleases.

SECTION –C

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

34. Write an essay on sex linked inheritance with reference to haemophilia and colour blindness in man.
35. Elaborate the methods of vectorless gene transfer in plants.
36. Describe the blotting techniques.
37. Explain the modification of Mendel's dihybrid ratio due to the action of complementary and duplicate genes.

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