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 2017
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. Which among the following is a possible abbreviation for genotype?
   a. TR b. Tt c. Ts d. Tc
2. _____is a small, extra chromosomal circular double stranded DNA found in bacteria.
   a. Plastid b. Plasmin c. Helicase d. Plasmid
3. A _____ is a DNA construct, based on a functional fertility plasmid used for transforming or cloning in bacteria.
   a. BAC. b. LAC c. VAC d. PAC
4. _____ are sex chromosomes which carry genes responsible for sexual characteristics and as such have a significant role in the determination of sex.
   a. Autosomes b. Altosomes c. Blastosomes d. Allosomes
5. Which of the following is called a 'natural genetic engineer?
   a. *E.coli* b. *Agrobacterium tumeifaciens* c. *Bacillus thuringiensis* d. *Drosophila*

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

6. *Agrobacterium tumeifaciens* is a Gram _____ bacterium.
7. An _____ is one of a pair of genes that appear at a particular location on a particular chromosome and control the same characteristic.
8. _____ is a class of low molecular weight compounds found in plant crown gall tumors.
9. A synthetic oligonucleotide which contains a restriction site is called a _____.
10. A cross between an individual exhibiting the dominant phenotype of a trait and an individual that is homozygous recessive for that trait in order to determine the genotype of the dominant individual is called a _____.

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

11. Ligase is an enzyme which joins two segments of a DNA.
12. Colour blindness is a hereditary disease.
13. *Bacillus thuringiensis* produces endotoxins.
14. Rh incompatibility does not pose a problem for the first child.

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

15. Heterozygous ------- enzyme
16. Galls ------- TT
17. Homozygous ------- Octopine
18. Restriction endonucleases ------- Tt

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

19. Punnet square
20. Cry1Ac
21. YAC
22. cDNA
23. Epistasis
24. Hemophilia
25. Cytoplasmic inheritance
26. Nopaline
27. Vector

SECTION –B

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

28. With suitable illustrations distinguish between Southern and Northern blotting.
29. State and explain Mendel's laws of inheritance.
30. Discuss the ethical issues surrounding GM Crops.
31. Explain the genetic base of sex determination in humans and *Drosophila.*
32. Illustrate multiple alleles with special reference to ABO blood group types.
33. Elaborate on linkage and crossing over.

SECTION –C

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

34. Explain in detail about the different physical as well as *Agrobacterium* mediated gene delivery methods.
35. Write short notes on :
    a. Restriction endonucleases
    b. Ligation
    c. Adapters
    d. Linkers
36. Elaborate on multiple gene inheritance with respect to skin colour in man and ear length in Maize.
37. Write in detail about mapping in bacteria.

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