C 21146 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2017

(CUCBCSS—UG)

Microbiology

MBY 6B 14—MICROBIAL GENETICS AND GENETIC ENGINEERING

Time : Three Hours Maximum : 120 Marks

Part A

Answer **all** *the following.*
Each question carries ½ mark.

1. Crossing over takes place in ——— stage of prophase I.
2. The first gene therapy widely accepted was for the condition ———.
3. Mutation in the nucleotide sequence of chromosome number ——— results in sickle cell anemia.
4. The karyotype 47, XY,+ 21 represents the condition called ——— .
5. ——— cell cycle checkpoint is also known as the DNA damage checkpoint.
6. The disease hemophilia is a trait controlled by genes located on the ——— chromosome.
7. DNA replication takes place in G1 stage of cell cycle. True / false.
8. *Agrobacterium tumefaciens* is used for ——— .
9. The phenomenon of effect of one gene being dependent on the presence of one or more modifier genes is called ——— .
10. In ——— step of PCR, the polymerase extends the primer to form a nascent DNA strand.
11. Dideoxyribonucleotides lead to the termination of DNA elongation due to the absence of ———.
12. In blue white screening, cells with self ligated vector will appear as ———.

(12 × ½ = 6 marks)

Part B (Short Answer Type Questions)

Answer **all** *the following.*
Each question carries 3 *marks.*

13. Describe GM food.
14. Explain transformation.
15. Describe cyclins.

Turn over

16. Explain aneuploidy.
17. Describe importance of G1/S cell cycle checkpoint.
18. Write notes on linkage map.
19. Write notes on cloning vector.
20. Explain importance of Cry toxins.
21. Describe multiple alleles.
22. Explain significance of Luria Derlbrucki experiment.

(10 × 3 = 30 marks)

Part C (Short Essay Type Questions)

Answer any **six** *of the following.*
Each question carries 8 *marks.*

23. Describe extrachromosomal inheritance.
24. Explain various methods used for mutation detection.
25. Explain gene therapy.
26. Describe chromosome theory of inheritance.
27. Explain environmental effect on phenotypic expression.
28. Explain major processes in the prophase of meiosis I.
29. Explain PCR and its applications.
30. Describe programmed cell death.

(6 × 8 = 48 marks)

Part D (Essay Type Questions)

Answer any **two** *questions.*
Each question carries 18 *marks.*

31. Write an essay on cell cycle and its regulation.
32. Write an essay on terminator gene technology and its applications.
33. Describe crossing over, its cytological basis and molecular mechanism.

(2 × 18 = 36 marks)