C 1254 (Pages : 3) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION MARCH 2021

Microbiology

MBY 6B 14—MICROBIAL GENETICS AND GENETIC ENGINEERING

Time : Three Hours Maximum : 120 Marks

(Draw diagrams wherever necessary).

Section A

Answer **all** *questions.*
Each question carries ½ mark.

1. In ABO blood group inheritance in humans, if a person with B- blood group has children with a person of AB group, what are the possible blood groups in the children ?
2. Tautomerization of nitrogen base is a source of ——— mutation in cells.
3. When one gene influences one or more seemingly unrelated phenotypic traits ——— occurs.
4. The gene linkage minimizes the chances of ———.
5. Name any *two* reagents used to stabilize the protein after yeast cell disruption.
6. The phage mediated gene transfer mechanism in prokaryotes is called ———.
7. The enzymes used in rDNA technology to digest DNA at sequence specific sites are called ———.
8. What is the main enzyme component of Sanger method of DNA sequencing ?
9. A PCR efficiency '2' means.
10. The presence of an abnormal number of chromosomes in a cell is called ———.
11. 'Golden Rice' is noted for its ability to produce the precursor for ——— vitamin.
12. Ti plasmid used for the transfer of DNA to cells is isolated from ———.

(12 × ½ = 6 marks)

Section B

Answer **all** *questions.*
Each question carries 3 *marks.*

13. Discuss the Mendelian monohybrid F2 phenotypic ratio and genotypic ratio with example.
14. Differentiate incomplete dominance and codominance.
15. Discuss the principle of Luria-Delbruck experiment.
16. What is the mechanism involved in the separation of linked genes ? Explain.
17. Electroporation is used for taking up the DNA by cells. Comment on.
18. Discuss the disadvantages of enzymatic cell disruption.
19. What are the characteristics of an ideal cloning vector ?
20. What is meant by melting temperature (Tm) of DNA ?
21. Discuss the applications of recombinant microorganisms.
22. What are the basic traits transferred to GM crops ?

(10 × 3 = 30 marks)

Section C

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

23. Describe the mechanism of crossing over. Discuss the role of crossing over in biological evolution.
24. Write a note on extrachromosomal inheritance.
25. What are the three basic steps of conventional PCR ? Explain.
26. Write a note on transduction. Write on applications of transduction.
27. Describe the steps involved in the construction of genomic libraries.
28. Differentiate apoptosis and necrosis. Describe the mechanism of apoptosis.
29. Write a note on chromosomal aberrations.
30. Methods for screening and selection of recombinant clones.

(6 × 8 = 48 marks)

Section D

Write essays on any **two** *of the following.*

Each question carries 18 *marks.*

31. Define mutation. Write a note on different types of mutagens their mechanism of mutagenesis.

32. Comment on the following :

    (a) What are the main issues of concern for human health with GM foods ?

    (b) How is risk assessment for the environment performed with GM foods ?

    (c) What are the issues of concern for the environment with GM foods ?

33. Describe the cell cycle. Describe the different events occurring in a cell during mitosis.

(2 × 18 = 36 marks)