INTERNATIONAL INDIAN SCHOOL, DAMMAM

FIRST TERMINAL EXAMINATION- JUNE-2015

CLASS: XII
SUBJECT: BIOTECHNOLOGY

Time: 3 Hrs
Max Marks: 70

General instructions

(1) All questions are compulsory.
(2) There is no overall choice. However, internal choice has been provided in one question of three marks and three questions of five marks. You have to attempt only one of the choices in such questions. Question paper contains four sections – A, B, C and D
(3) Question numbers 1 to 5 are very short answer questions, carrying 1 mark each.
(4) Question numbers 6 to 15 are short answer questions, carrying 2 marks each.
(5) Question numbers 16 to 25 are also short answer questions, but carrying 3 marks each.
(6) Question numbers 26 to 28 are long answer questions, carrying 5 marks each.
(7) Use of calculators is not permitted. However, you may use log tables, if necessary.

SET A

SECTION A (1 Mark)

1. If the gene coding for the gas hormone, ethylene in plants is mutated, what commercial importance can this serve?

2. Will you prefer bacterial or yeast host for expression of eukaryotic products. Give one reason?

3. Write the role of high concentration of auxins and cytokinins in organogenesis of plant tissue culture

4. Expand GRAS, GMO, GMP.

5. Name two molecular/selectable marker genes used in RDT experiments.

SECTION B (2 Marks)

6. A gene coding for enzyme A inhibits pollen formation and another gene coding for enzyme B block the enzyme A so that normal pollens are formed.
   (a) Identify enzyme A and B.
   (b) Name the source of gene for enzyme A

7. Write a short note on pBR322.

8. Explain how gene gun functions to deliver gene into plant cells.

9. Schematically represent the steps of making recombinant plasmid.

10. Explain how antifoam agents play important role in microbial culture media.

11. How interspecific/intergeneric cross lead to sterile seeds. Suggest a plant tissue culture method to overcome this problem.

12. Distinguish between blunt end and sticky end cutting of restriction enzymes.
13. What are the two ways adopted in plant biotechnology to improve the production of secondary metabolites?

14. Name three enzymes used in cloning and write one function each.

15. List four advantages of animal cell culture.

SECTION C (3 Marks)

16. Schematically represent the characteristic features of batch and continuous cultures.

17. A bacterial culture contain $10^4$ cells/ml in the beginning. Two hours later it was found to have $10^8$ cells/ml. calculate
   (a) specific growth rate of culture
   (b) doubling time

18. List the various applications of microbial culture technology.

19. Illustrate schematically the basic steps involved in site directed mutagenesis.

20. What are the biotechnological approaches for the conservation of plant germplasm?
   OR
   There are several concerns being raised in accepting transgenic crops. List any four of them.

21. Explain the three methods of strain preservation.

22. Indicate the main disadvantage of vegetative propagation of plants. Briefly outline the steps involved in micropropagation to overcome these problems.

23. Explain molecular farming. List two potential example for transgenic plants as bioreactors.

24. Write a short note on lytic pathway of bacteriophage? Specify the importance of cos site in lambda phage.

25. Briefly explain various vessels or equipments used in microbial cell culturing.

SECTION D (5 Marks)

26. Describe the Sanger's technique of DNA sequencing. Draw suitable diagram.
   OR
   Describe the Southern hybridization technique with a suitable diagram.

27. Explain with a suitable flow chart, vector mediated gene transfer in plant biotechnology.
   OR
   Give a brief note on different types of cultures under plant tissue culture.

28. Explain various steps involved in isolation of microbial products. Draw the flow chart of the isolation of extracellular microbial metabolite citing an example.
   OR
   Describe various techniques to improve the desirable characteristics of the strain.