2015

BIOTECHNOLOGY

[Honours]

PAPER — II (New)

Full Marks : 90

Time : 4 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP — A

(*Microbiology*)

Answer any **two** questions from the following : 15 × 2

1. (*a*) State Koch's postulates. Name the father of
    Microbiology.   4 + 1

(*b*) Classify Bacteria on the basis of biochemical nature.   5

(*c*) Draw the ultrastructure of a bacterial flagella with proper labelling.   5

2. (*a*) Distinguish between Lysogenic and Lytic phage, with the aid of diagram. $\left(2\frac{1}{2}+2\frac{1}{2}\right)$

(*b*) In how many ways can virus be classified ? Briefly mention the various groups with examples.   2 + 4

(*c*) Describe the glycolytic pathway for energy production in a microbe.   4

3. (*a*) Graphically represent the normal growth curve of a bacteria.   5

(*b*) State the role of Broad spectrum Antibiotics and their mode of action.   3 + 3

(*c*) Draw a labelled diagram of the cell wall of a Gram positive bacteria.   4

4. (*a*) Schematically represent the morphology of a general bacteria, indicating all the structural components.   5

    (*b*) State the difference between an Endospore and Exospore.   3

    (*c*) Define pure culture. What is meant by a strain.   2 + 1

    (*d*) Compare the efficacy of penicillin and Antifungal antibiotics.   2 + 2

GROUP — B

(*Genetics*)

Answer any **five** questions from the following :   6 × 5

5. Explain the Griffith's experiment to prove that DNA is the genetic material.   6

6. (*a*) Describe Transposable Genetic Elements with an example.   2 + 1

(*b*) What is the difference between somatic and Gametic mutation.   3

7. Describe different types of chromosomal aberrations.   6

8. (*a*) Explain C-value paradox ?   3

    (*b*) Define satellite DNA with example.   3

9. Write down the bases of Klinefelter's and Turner's syndrome.   3 + 3

10. Enlist three traits linked with X-chromosome and three traits linked with Y-chromosome.   3 + 3

11. (*a*) Mention the biochemical basis of sickle-cell anaemia.   3

    (*b*) Define Hardy-Wienberg's law.   3

12. (*a*) Illustrate the process of transduction in a bacteria.   3

    (*b*) Explain with an experiment how 1 : 3 : 1 ratio was obtained by Mendel.   3

GROUP – C

(Computer Application and Bioinstrumentation)

Answer any **five** questions from the following : 6 × 5

13. (*a*) Draw the different components of a digital computer with proper labelling. 3

(*b*) Compare features of Microsoft Power Point with that of MS Word. 3

14. (*a*) Classify operating system and give an example for each type. 2 + 1

(*b*) State the major roles of an operating system. 3

15. (*a*) Compare the characteristics of 4th and 5th Generation Computers. 3

(*b*) Give examples of data types, operators and expression in C Programming. 3

16. Write down the steps in the construction of Excel chart. What do you mean by 'Deadlock' ? 4 + 2

17. State the difference between TLC and GLC. Graphically represent a chromatogram.   3 + 3

18. State the conditions that need to be fulfilled in order for Beer-Lambert law to be valid.   6

19. Elucidate the experimental technique of Raman effect. Distinguish between pure rotational and vibrational spectroscopy.   3 + 3

20. (*a*) Mention the factors affecting sedimentation velocity during a centrifugation.   3

    (*b*) List the advantages of phase contrast microscopy.   3