UG/I/BIOT/H/II/17

2017

BIOTECHNOLOGY

[Honours]

PAPER – II

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

GROUP – A

(*Microbiology*)

Answer any two questions from the following : 15 × 2

1. (*a*) Distinguish between Lysogenic and lytic phage. 4

(*b*) Classify Bacteria on the basis of biochemical nature of metabolism. Provide reactions for each category. $2+4\frac{1}{2}$

(*c*) Why is Glycolysis considered as a two-stage process ? What do you mean by Homolactic fermentation ? $3+1\frac{1}{2}$

2. (*a*) What do you mean by Antimycins ? Comment on their inhibitory action. $1+2$

(*b*) How is food poisoning caused by bacteria ? 2

(*c*) Schematically represent Redox reaction. 5

(*d*) Explain the kinetics of Bacterial growth in details. 5

3. (*a*) Name the causal organisms of Pneumonia and Poliomyelitis. 2

(*b*) State the location and utility of a plasmid. 2

(*c*) Illustrate the detailed structure of the cell wall of a Gram negative bacteria. 5

(*d*) Tabulate the salient features of Algae, Fungi and Protozoa. 2×3

4. (*a*) Compare the properties of solid and liquid culture media. 4

(*b*) Write a short note on Yellow Fever Virus. 4

(*c*) Classify bacteria on the basis of oxygen requirement. 4

(*d*) List the factors influencing yield of an antibiotic. State the phase in which penicillin remains normal pH. 2 + 1

GROUP – B

(*Genetics*)

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

5. Explain the structure of chloroplast genome. How it differs from nuclear DNA ? 3 + 3

6. Write short notes on any *three* : 2 × 3

(*i*) Alkaptoneuria

(*ii*) Sex linked inheritance

(*iii*) Klinefelter's syndrome

(*iv*) Pseudogene.

7. Explain Hardy-Wienberg's equilibrium. How the mutation effect gene frequency ? 3 + 3

8. Illustrate the differences between transformation and transduction of genetic material of bacteria. 6

9. Explain the concept of "central Dogma". What is 'one-gene, one-polypeptide' ? Explain with example. 3 + 3

10. What is chromosomal aberration ? Explain the role of chemical carcinogens as mutagenic agent. 2 + 4

11. What is cot curve ? State its significance. Explain the biochemical technique to measure the repetitive DNA in a genome. 3 + 3

12. Briefly describe prokaryotic and eukaryotic gene clusters. Describe the dihybrid cross of Mendel's Experiment. 3 + 3

GROUP – C

(*Computer Application and Bioinstrumentation*)

Answer any five questions from the following : 6 × 5

13. State the different types and roles of an operating system.

14. (*a*) Enlist the characteristics of 3rd and 4th Generation computers.

    (*b*) Give examples of input and output devices.

15. (*a*) Convert the hexadecimal number '4F' to decimal number.

    (*b*) What is the difference between character and string ? Give their examples.

16. Elaborate the important facilities provided by Microsoft Word, Excel and Power Point.

17. Define Quantum. Elucidate the principle and applications of spectrophotometry.

18. In two-dimensional chromatography and electrophoresis, such as is employed in fingerprinting technique, does it matter which is done first ? Explain.

19. Compare the efficacies of various microscopical techniques.

20. (*a*) Distinguish between 'Homogenate' and 'Supernatant'.

(*b*) Distinguish between Adsorption and Partition Chromatography.
