2015

MICROBIOLOGY

[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

Answer any **two** questions : 15×2

1. Describe transamination reaction with example. Describe urea cycle and mention it's significance. How phenylalanine and glycine are used as carbon source ? $3 + (4 + 4) + 4$

2. What is energy charge of a cell ? Why cAMP not, ADP or ATP act as regulatory molecule ? Describe various types of phosphorylation that occur in living system with example. Describe various components of electron transport chain in an aerobic eukaryote. 2 + 2 + 6 + 5

3. Schematically describe pentose phosphate pathway (PPP). Describe the significance of PPP. Calculate the energetics of this pathway. 8 + 4 + 3

4. Describe various steps of SDS-PAGE electrophoresis of proteins. How can you control generation of heat during electrophoresis ? Briefly discuss various staining method of electrophoretically separated protein bands. 8 + 3 + 4

GROUP–B

Answer any **five** questions from the following : 8 × 5

5. What is bactoprenol ? Schematically describe various steps of peptidoglycan biosynthesis. 2 + 6

(*Continued*)

6. Distinguish between exergonic and endergonic reactions. How can you calculate standard free energy change of a biochemical reaction ? What is activation energy ? 2 + 4 + 2

7. What is ion product of water ? Briefly discuss about the Gibbs Donnan membrane equilibrium. 3 + 5

8. Briefly describe the steps of β-oxidation of an even number fatty acids. 8

9. Describe schematically the catabolism of purine. Draw the structure of adenine. 6 + 2

10. Distinguish between half life and average life of a radioisotope. Briefly discuss hazards of radioactivity in living system. 4 + 4

11. Briefly describe the principle and application of gel-filtration technique. 4 + 4

12. Draw a peptide bond in between two amino acids. Describe any one kind of secondary structure of protein with suitable sketch. 2 + (4 + 2)

GROUP–C

Answer any **five** questions from the following : 4×5

13. What do you mean by optical isomerism ? 4

14. Name non-protein amino acids and their function. $2 + 2$

15. Classify steroids and their significance. $3 + 1$

16. Distinguish between *B* and *Z* DNA. $2 + 2$

17. Write the Michaelis-Menten equation. How V_{max} is calculated ? $2 + 2$

18. Schematically represent Entner Doudoroff pathway. Where it is found ? $3 + 1$

19. What are Lipproteins and mention their significance ? $3 + 1$

20. Describe the role of buffers in biological system. 4