OLD

2015

Part-I 3-Tier

MICROBIOLOGY

PAPER—II

(Honours)

Full Marks : 90

Time : 4 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

Group—A

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

1. (a) Write short notes on :

(i) D–L isomerism ;

(ii) PK and isoelectric point ;

(iii) Sphingolipids.

(b) Distinguish between B-DNA and Z-DNA. (3+3+3)+6

2. (a) Describe the mode of enzyme action with reference to specificity and enzyme-substrate formation.

(b) Distinguish between kinetic properties of non-competitive and uncompetitive enzyme inhibition.

(c) Discuss the concerted model of allosteric modulation. (3+3)+6+3

3. (a) Describe the sequential enzymatic reactions in Kreb's cycle and calculate the total number of ATP which is generated from one mol of glucose.

(b) Describe the metabolism of Glycine and lysine. (6+3)+(3+3)

4. (a) Define pH and buffer. How pH of a buffer solution is determined ?

(b) What do you mean by ATP-ADP cycle ?

(c) Write about Gibb's concept of free energy with reference to living system.

(d) What is meant by diffusion coefficient ? (2+4)+4+4+1

Group—B

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

5. Describe the pathway and significance of urea cycle. 6+2

6. (a) Describe the formation and significance of lipoproteins.

   (b) What is redox loop? (4+2)+2

7. (a) State the principle and uses of ion-exchange chromatography.

   (b) What is polyacrylamide gel electrophoresis? Mention its uses. (3+1)+(3+1)

8. State the different steps and significance of deamination and transamination with suitable examples in each. 4+4

9. (a) What do you mean by half life and average life of radioisotopes.

   (b) Write about gamma radiations. 4+4

10. (a) Distinguish between Simple diffusion and carrier mediated diffusion.

    (b) How do the concentration gradients of solutes affect the diffusion? 4+4

11. (a) Describe the role of transketolase and transaldolase in pentose-phosphate pathway.

    (b) Write the significance of pentose-phosphate pathway.

    (c) Name one inhibitor of glycolysis by mentioning its mechanism of action. 4+2+2

12. (a) Distinguish between lyophilic and lyophobic colloid with examples.

(b) Discuss the electrokinetic properties of colloid by mentioning their significance in biological system. 4+4

Group—C

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

13. Write the composition of peptidoglycan. 4

14. Distinguish between α-helix and β-pleated-sheet. 4

15. What is positional isomerism of lipids ? 4

16. Write short note on Tm value. 4

17. "Photosystem I and II are linked by a series a Carriers" — what roles do these carriers have ? 4

18. Write about the salvage pathways of purine. 4

19. State and explain the Van't Hoff Law, with special reference to osmotic pressure in biological system. 4

20. How phenyl alanine is degraded ? 4

———