

2016

MICROBIOLOGY

[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

[NEW SYLLABUS]

GROUP – A

Answer any two questions : 15 × 2

1. Distinguish between catalytic site and allosteric site of an enzyme. Derive Michaelis-Menten equation for a single substrate enzymatic reaction. How can you transform Michaelis-Menten

(Turn Over)

equation to the form $Y = mx + c$? How does competitive inhibition of enzyme activity differ kinetically from non-competitive inhibition?

2 + 6 + 3 + 4

2. Describe the biosynthesis of purines through salvage pathways. Discuss the process of formation of ketone bodies. "The peptide bond is rigid and planar" – explain. Draw the structure of triacylglycerol containing two molecule of palmitic acid (C_1 and C_2) and one stearic acid at C_3 .

5 + 4 + 4 + 2

3. How will you find the absorption co-efficient of a suitable biological sample with the help of Lambert-Beer's Law? Explain the principle of colorimeter in estimating the concentration of coloured substances in biological work. Mention the application of radioactive isotopes in biology.

4 + 5 + 6

4. Describe the different steps of Entner-Doudoroff pathway. Mention its significance. Discuss different steps of Glyoxalate cycle and state the significance of the cycle. What is peptidoglycan?

6 + 2 + (4 + 1) + 2

GROUP - B

Answer any five questions from the following : 8×5

5. What is Markonikoff rule ? What is elimination reaction ? What is electrophilic substitution ? $2 + 3 + 3$
6. Draw Fischer and Haworth Projections for glucose. Glucose is dextrorotatory but after treatment with dilute HCl the mixture become levorotatory - explain. $4 + 4$
7. What is the concentration of OH^- in a solution with a H^+ concentration of 1.3×10^{-4} M. State briefly how you can find out pKa of a weak acid by using the titration curve. $2 + 6$
8. How does α oxidation differ from β oxidation. Describe β oxidation of a even carbon number fatty acid. $2 + 6$
9. What do you mean by denaturation and annealing of DNA ? How temperature and pH affect the rates of enzyme-catalysed reaction. $2 + 6$

10. Define one curie. Mention two important properties of each of α , β , and γ radiation. 20% of a radioactive substance decays in 5 days, what will be the amount of the original material left after 10 days. 2 + 4 + 2
11. What is entropy? Explain Gibbs free energy with reference to the living system. 3 + 5
12. Give two biological application from each of the following : 2 × 4
- (i) Surfactant
 - (ii) Osmosis
 - (iii) Hydrogen band
 - (iv) Buffer.

GROUP – C

Answer any five questions from the following : 4 × 5

13. What is the function of tRNA? Schematically draw the structure of mRNA and point out the different parts of the mRNA. 2 + 2

14. What do you mean by sphingolipid and glycolipids. 4
15. "RNA is alkaline sensitive but DNA is not". –
Explain it. 4
16. Describe the electrical properties of colloid. 4
17. Describe the cis-trans and positional isomerism
of fatty acid. 4
18. What is uncouplers ? What is redox potential ? $\frac{2}{2} + 2$
19. Define structural and functional protein with
example. 4
20. Briefly describe the principle of gel filtration
technique. 4
-