

Sr. No. 0192

ENTRANCE TEST-2019
SCHOOL OF BIOLOGICAL SCIENCES
BIOTECHNOLOGY
Paper-II

Total Questions : 20
Time Allowed : 120 Minutes

Roll No. :

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Note :— Each question carries 2 marks.

1. 20 ml each of 0.20 M acetic acid and 0.30 M sodium acetate is mixed, calculate the pH of the existing solution.
(Given pKa acetic acid = 4.76 and $\log(15) = 1.18$ approx.)

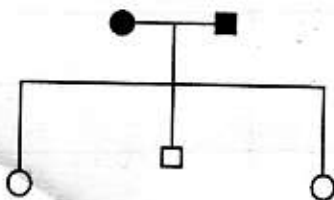
2. What is the concentration of H⁺ in a solution of 0.1 M NaOH?

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3. Draw a pair of free energy diagrams with correctly labeled axes that show the differences between the following reactions : an endergonic reaction versus an exergonic reaction.

4. In a chemical labeling study of an enzyme, a reagent that covalently modifies Lys residues also abolishes enzyme activity. Why doesn't this observation prove that the active site includes a Lys residue ?

5. One form of congenital deafness in humans is inherited as a recessive condition and controlled by two independent genes (A and B). In the pedigree shown below, two deaf individuals have children with normal hearing ability. What would be the probable genotypes of the deaf parents ?



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6. Explain the role of Mg^{2+} ions in ATP hydrolysis under in vivo conditions.

7. Explain briefly, splicing.

8. How do retroviruses cause cancer ?

9. Draw structure of phosphatidylcholine.

10. Draw the structure of Serine.

11. What role does cAMP play in lac operon ?

12. What is the difference between a BAC and YAC ?

13. Explain the role of epinephrine.

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14. How is the classical complement pathway activated?

15. Calculate the doubling time for bacterial cell mass (in exponential phase), given net specific growth rate 0.3/hour.

16. Plot substrate saturation curve for the action of Phosphofructokinase-1 using F6P as substrate, show what happens to the curve in the presence of AMP and ATP.

17. List any two differences between DNA pol II and III of E.coli.

18. Explain role of MHC class II molecules.

19. What is cloning Vector ? List 2 essential characteristics it must possess.

20. Draw a Lineweaver-burk plot. Label the slope and intercepts.

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