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| **University of Kerala** | | |
| **Discipline: Biochemistry** |  | **Time: 1 Hour 30 Minutes (90 Mins.)** |
| **Course Code: UK1DSCBCH103** |  | **Total Marks: 42** |
| **Course Title: Biochemical and Biophysical Aspects of Life** |  |  |
| **Type of Course: DSC** |  |  |
| **Semester: 1** |  |  |
| **Academic Level: 100-199** |  |  |
| **Total Credit: 4, Theory: 3 Credit, Practical: 1 Credit** |  |  |

**Part A. 6 Marks.** Time: 5 Minutes

Objective Type. 1 Mark Each. Answer All Questions

(Cognitive Level: Remember/Understand)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 1. | Define an Arrhenius acid and provide an example. | Remember | CO1 |
| 2. | Define "colloid" and give two examples of colloidal systems. | Remember | CO2 |
| 3. | How do emulsifying agents work to stabilize emulsions? Provide an example. | Understand | CO2 |
| 4. | Explain the difference between the Bronsted-Lowry and Lewis concepts of acids and bases. | Understand | CO1 |
| 5. | Name two biological molecules that contain covalent bonds. | Understand | CO2 |
| 6. | List three methods of expressing concentration in a solution. | Understand | CO2 |

**Part B. 8 Marks.** Time: 24 Minutes

Short Answer. 2 Marks Each. Answer All Questions

(Cognitive Level: Understand/Apply)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 7. | Describe a glycosidic bond and its significance in carbohydrates. | Understand | CO2 |
| 8. | What is osmotic pressure? | Understand | CO2 |
| 9. | A solution contains 0.02 M hydrochloric acid (HCl). Calculate the pH of this solution. | Apply | CO1 |
| 10. | Summarise the roles of the organelles found in eukaryotic cells. | Apply | CO3 |

**Part C. 28 Marks.** Time: 60 Minutes

Long Answer. 7 Marks Each.

Answer all 4 questions, choosing among options within each question.

(Cognitive Level: Apply/Analyse/Evaluate/ Create)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 11. | Explain the importance of buffers in biological systems. | Apply | CO1 |
| OR |
| A sample of vinegar has a hydronium ion concentration of 1×10−3M. Calculate the pH of the vinegar and classify the solution as acidic, neutral, or basic. |
| 12. | In a laboratory experiment, if you observed the Tyndall effect in a solution, what conclusion could you draw about the nature of that solution? | Analyse | CO2 |
| OR |
| Explore the applications and importance of osmosis in a range of daily activities. |
| 13. | What are peptide bonds, and how do they contribute to protein structure? | Apply | CO2 |
| OR |
| Explain the effects of ionic and hydrogen bonds on the stability of a protein tertiary structure. |
| 14. | Create a visual diagram that illustrates the key differences between prokaryotic and eukaryotic cells, including their structures and functions. | Evaluate | CO3 |
| OR |
| Describe the structure of a virus. |