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SEAT No._____

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[89/446/447] **SARDAR PATEL UNIVERSITY**

M.Sc. (Integrated) Biotechnology, Second Semester Examination
Wednesday 15th November,
2017
2:00 p.m. to 5:00 p.m.
Biophysical chemistry: PS02CIGB02

Total Marks : 70

Note: (i) All questions are to be attempted. (ii) Figures to the right indicate marks.

Q.1 **Choose the correct option for the following :** [08]

(i) The reaction of an anion or cation with water accompanied by cleavage of O-H bond is called.....
(a) Neutralization (b) Hydrolysis (c) Ionization (d) Acidification

(ii) Substance which donates hydrogen ions is .....
(a) acids (b) bases (c) neutral (d) aprotic

(iii) A process in which heat is constant is called .....
(a) isothermal (b) isobaric (c) adiabatic (d) isochoric

(iv) Which out of the following is not an intensive property?
(a) Pressure (b) Concentration (c) Density (d) Volume

(v) Osmotic pressure can be measured by .....
(a) Manometer (b) Osmometer (c) Stalagnometer (d) P^H meter

(vi) With rise in temperature, surface tension of liquid .....
(a) increases (b) decreases (c) remain constant (d) none

(vii) Which form of radioactivity is most penetrating ?
(a) Alpha rays (b) Beta rays (c) Gamma rays (d) X-rays

(viii) An alpha particle contains same nucleus as ..... atom.
(a) Ar (b) O (c) Ne (d) He

Q.2 **Answer the following (Attempt any seven) :** [14]

(i) What are lewis acid and lewis base ? Give two examples for each.
(ii) Write dissociation process of acetic acid and define dissociation constant.
(iii) Define: Specific viscosity.
(iv) Explain: Isothermal process and adiabatic process.
(v) Enlist various factors affecting the viscosity of the liquid.
(vi) Define: Osmosis and diffusion.
(vii) Explain: Internal energy and entropy.
(viii) Calculate the disintegration constant of Co-60. Given: $t_{1/2}$=5.2 yrs.
(ix) Write any two characteristics of alpha and beta particles.

P.T.O.

Q.3 Answer the following :

[A] Define : Buffer solution and explain its function. [6]

[B] Define acid-base indicators. Explain the action of various indicators during titration process. [6]

OR

[B] Discuss in brief about Arrhenius theory of acids and bases. [6]

Q.4 Answer the following:

[A] Describe the different types of thermodynamic processes. Derive the relation : $\Delta H = \Delta E + \Delta nRT$ [6]

[B] Describe the Gibbs halmholtz equation. [6]

OR

[B] Distinguish between reversible and irreversible process. [6]

Q.5 Answer the following:

[A] Define Viscosity. Enlist different type of viscometer used in viscometry and also discuss any one viscometry method. [6]

[B] Write a note on Osmotic behavior of cells. [6]

OR

[B] Define osmotic pressure. Enlist measurement methods of osmotic pressure. Discuss any two methods in detail. [6]

Q.6 Answer the following:

[A] Define radioactivity. Discuss radioactive decay using suitable example. [6]

[B] Discuss the importance of radioisotope in biology. [6]

OR

[B] Distinguish between: G.M. counter and liquid scintillation counter. [6]