



# SHREE H. N. SHUKLACOLLEGE OF SCIENCE

(AFFILIATED TO SAURASHTRA UNIVERSITY)

Shree H.N. Shukla College Campus Nr. Lalpari lake, Behind old Marketing Yard,  
Amargadh, Bhichari, Rajkot-360001, Ph. No-9727753360

## T.Y. B.Sc. Chemistry

### Sem: 5 (C-503) – Preliminary test

[Time: \_\_\_\_\_ Minutes]

Date: 22/10/2021

[Total Marks: 70]

**Instruction: 1. All questions are compulsory.  
2. The right-side figure indicates total marks of the question.**

**Q.1 (A) Answer the following short Questions. (1 Mark each)** [04]

- 1) For a cyclic process the change in internal energy of the system is equal to \_\_\_\_\_
- 2) Define cyclic process.
- 3) State two characteristic of natural process.
- 4) Which thermodynamic function is measure of disorder?

**(B) Answer the following Question. (Any one)** [02]

- 1) Discuss about the spontaneous process.
- 2) Calculate the amount of heat absorbed by the reversible cycle working between 358 K and 280 K. The maximum work obtained is 892 J.

**(C) Answer the following Question. (Any one)** [03]

- 1) Write any three statements of second law of thermodynamics.
- 2) Explain entropy change in physical transformation.

**(D) Answer the following Question. (Any one)** [05]

- 1) Derive the equations for change in entropy with respect to temperature, pressure, volume for ideal gas.
- 2) Explain Carnot's cycle with its operation (process) in detail.

**Q.2 (A) Answer the following short Questions.** [04]

- 1) In electrochemical cell \_\_\_\_\_ energy is converted into \_\_\_\_\_ energy.
- 2) Left side of electrochemical cell is known as \_\_\_\_\_
- 3) For three component system and one phase what will be degree of freedom.
- 4) Define standard half-cell.

**(B) Answer the following Question. (Any one)** [02]

- 1) Explain primary reference electrode in detail.
- 2) Explain phase and component.

**(C) Answer the following Question. (Any one)** [03]

- 1) Write short note on glass electrode.
- 2) Discuss the stocks and Roozeboom's method of graphical representation for ternary system.

**(D) Answer the following Question. (Any one)** [05]

- 1) Discuss the formation of one pair of partially miscible liquids in a ternary system.
- 2) Explain in detail: Reversible cell and Irreversible cell.

**Q.3 (A) Answer the following short Questions. (1 Mark each)** [04]

- 1) Define: Optical Density.
- 2) When it is said that lamberts-beer's law is followed?
- 3) Give the Helmholtz equation for change at constant volume in reference of work function.
- 4) Define work function.



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**(B) Answer the following Question. (Any one)** [02]

- 1) Discuss the effect of pressure on melting point of ice.
- 2) Give the difference between thermal and photochemical reaction.

**(C) Answer the following Question. (Any one)** [03]

- 1) Derive Lambert's-Ber's Law.
- 2) Prove  $-\Delta G = W_{\text{net}}$ .

**(D) Answer the following Question. (Any one)** [05]

- 1) Explain spectrophotometric estimations.
- 2) Explain and derive Vant-hoff isotherm equation.

**Q.4 (A) Answer the following short Questions.** [04]

- 1) Define chelate.
- 2) Which salt of EDTA is used to prepare standard EDTA solution?
- 3) Give the unit of specific conductance.
- 4) Give factors affecting conductance.

**(B) Answer the following Question. (Any one)** [02]

- 1) Explain method of preparation of standard EDTA solution.
- 2) What is conductivity water? How will you prepare conductivity water?

**(C) Answer the following Question. (Any one)** [03]

- 1) Explain walter's rules and  $pM \rightarrow$  EDTA curve for EDTA titration.
- 2) Explain conductometric titration of weak acid against strong base.

**(D) Answer the following Question. (Any one)** [05]

- 1) Explain various types/methods of EDTA titration.
- 2) Describe the method to determine solubility and solubility product of sparingly soluble salt by conductance measurement.

**Q.5 (A) Answer the following short Questions.** [04]

- 1) Iodometry and iodimetry are \_\_\_\_\_ type of titration.
- 2) Name any two primary standard solution.
- 3) Define mole fraction.
- 4) Which solution can be used as self-indicator in redox titration?

**(B) Answer the following Question. (Any one)** [02]

- 1) How many grams of  $\text{KMnO}_4$  is required to prepare 250 ml of 0.5 M  $\text{KMnO}_4$  solution?  
(MW OF  $\text{KMnO}_4 = 158 \text{ gm/mol}$ )
- 2) Calculate molarity of 2 liter solution containing 100 gm. NaOH. (MW OF NaOH = 40 gm/mol)

**(C) Answer the following Question. (Any one)** [03]

- 1) Explain primary standard.
- 2) Write the principle of redox indicator.

**(D) Answer the following Question. (Any one)** [05]

- 1) Explain titration curve for polyprotic acid and strong base in detail.
- 2) Explain precipitation titration of halide by Mohr's method.