

Enrollment No: _____

Exam Seat No: _____

C. U. SHAH UNIVERSITY

Winter Examination-2021

Subject Name : Electroanalytical Techniques

Subject Code : 5SC03ETC1

Branch: M.Sc. (Chemistry)

Semester: 3

Date: 15/12/2021

Time: 02:30 To 05:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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SECTION – I

Q-1 **Attempt the Following questions** **(07)**

- a. Define electroanalytical techniques. **(01)**
- b. State faraday's second law. **(02)**
- c. Define amperometry. **(01)**
- d. Which electrodes are used in voltametric instrument? **(01)**
- e. Write Nernst equation. **(01)**
- f. Define biosensor. **(01)**

Q-2 **Attempt all questions** **(14)**

- a. How alternate current polarography was developed as first modification to DC polarography? **07**
- b. Discuss the cyclic voltammetry. **07**

OR

Q-2 **Attempt all questions** **(14)**

- a. Discuss the technique "stripping analysis" and give its importance for quantitation of trace electroactive analyte? **07**
- b. Explain the instrumentation of voltammetry. **07**

Q-3 **Attempt all questions** **(14)**

- a. Write a note on potentiometric ion selective electrodes with example. **07**
- b. Name the three generation of amperometric biosensors and explain the first generation of oxygen electrode-based biosensors. **07**

OR



- Q-3** **a.** Explain the application of field effect transistors sensors. **07**
b. Explain the potentiometric biosensor with example. **07**

SECTION – II

Q-4 **Attempt the Following questions** **(07)**

- a.** Give the basic difference between polarography and voltammetry. **(02)**
b. Give the full form of TTF and TCNQ. **(01)**
c. Name the two modified AC polarographic techniques with improved sensitivity. **(02)**
d. Draw the structure of ferrocene. **(01)**
e. What is DME? **(01)**

Q-5 **Attempt all questions** **(14)**

- a.** Discuss the electro gravimetric analysis at constant current. **07**
b. Explain the coulometric analysis at controlled potential and at controlled current. **07**

OR

- Q-5** **a.** How are impedance measurement useful to study current-voltage relation. **03**
b. Write a note on electrocapillary. **08**
c. Differentiate between voltaic cell and electrolytic cell with labelled diagram. **03**

Q-6 **Attempt all questions** **(14)**

- a.** Explain the formation of electrical double layer “the model proposed by Stern”. **07**
b. Give short note on diffusion transport. **07**

OR

- Q-6** **Attempt all Questions**
- a.** State principle of coulometry and explain different coulometric analysis. **08**
b. Write a short note on electrolysis. **06**

