

G 17001121



17001121

Reg. No.....

Name.....

**M.Sc. DEGREE (C.S.S.) EXAMINATION, MAY 2017**

**Fourth Semester**

Faculty of Science

Branch III—Chemistry—Pure Chemistry

CH 4E 03—ADVANCED PHYSICAL CHEMISTRY

(2012 Admissions—Regular)

Time : Three Hours

Maximum Weight : 30

**Section A**

*Answer any **ten** questions.  
Each question carries a weight of 1.*

1. Give notes on Miller indices.
2. What is meant by most probable velocity?
3. Define screw axis.
4. What are pH sensors? Give example.
5. What are the disadvantages of AES?
6. Write a note on the influence of pressure and temperature on conductance of ions.
7. Write notes on Glide planes.
8. Write down Ilkovic equation and what are its letters stand for.
9. What is half wave potential?
10. Define mean free path and collision frequency. How do they vary with pressure and temperature?
11. What is liquid junction potential?
12. Write the Fourier transform of electron density function.
13. Write a note on translational symmetry.

(10 × 1 = 10)

**Section B**

*Answer any **five** questions.  
Each question carries a weight of 2.*

14. Write Debye Huckel limiting law. Suggest one method to verify the law.
15. Show that 5-fold axis of rotation cannot exist in solids.

Turn over





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16. Briefly describe the methods of characterising crystal structure.
17. What are the advantages of "dropping mercury electrode" in polarography? Explain.
18. How does viscosity of a gas originate? Derive an expression for viscosity of a gas.
19. Write a note on sensing techniques based on collisional quenching.
20. Briefly describe the Chemistry of fuel cells with example.
21. Write a note on Flame emission spectroscopy.

(5 × 2 = 10)

### Section C

*Answer any two questions.*

*Each question carries a weight of 5.*

22. Explain theories of over voltage.
23. (i) What is the expression for structure factor,  $F(hkl)$  for (a) primitive cubic unit cell; (b) FCC lattice; (c) BCC lattice.  
(ii) Comment on strong and weak reflections.
24. Briefly explain principle and instrumentation of AAS.
25. Discuss briefly polarographic method of chemical analysis.

(2 × 5 = 10)

