

18. (a) How will you example photosynthen's and dipolemoment of excited molecules?

Or

- (b) Discuss stern - Volmer equation and its applications.
19. (a) Discuss about ultracentrifuge methods in detail.

Or

- (b) Write a brief note on :
- (i) Solitons (2)
- (ii) Polarons and bipolarons. (6)
20. (a) Explain hybrid orbitals in non-linear molecules and construction of molecular orbitals by LCAO in BF_3 .

Or

- (b) Give a note on :
- (i) Symmetry elements and summetry operation in detail (6)
- (ii) Direct product representation. (2)

Reg. No. :

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2011.

Second Semester

Chemistry

PHYSICAL CHEMISTRY - II

(For those who joined in July 2008 and afterwards)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 1 = 10 marks)

Answer ALL the questions.

- What do you mean by 'inter-ionic effect'?
- Write down the equation for calculating the ionic strength.
- How will you relate over potential and current density?
- What will be the effect of bubble formation on hydrogen gas evaluation?
- Explain any two reasons for low quantum yields.
- What will be the products of the following ?



7. Write any one preparation of polyvinylchloride.
8. Write down the equation of standing wave equation to be used in isometric analysis.
9. Point out the symmetry elements and locate them for HF molecules.
10. Define symmetry operations.

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) How will you determine the activity co-efficient by electrical method?
Or
(b) Explain the electrical double layer and its significance.
12. (a) Discuss the principle of electrode deposition.
Or
(b) Explain : the mechanism of the hydrogen and oxygen evolution reaction.
13. (a) Write a brief note on "The photochemical rate law".
Or
(b) Calculate the number of moles of HCl(g) produced by the absorption of one joule of radiant energy of wave length 480 nm in the reaction $\text{H}_{2(g)} + \text{Cl}_{2(g)} \rightarrow 2 \text{HCl}_{(g)}$ if the quantum yield of the photochemical reaction is 1.0×10^6 .

14. (a) Explain the Gel permeation chromatography.
Or
(b) How will you explain the molar masses of polymers?
15. (a) Explain the character table for C_3 point group.
Or
(b) Verify that the characters given in the C_{2v} point group obey the properties of the irrerepresentative.

SECTION C — (5 × 8 = 40 marks)

Answer ALL the questions, choosing either (a) or (b).

16. (a) Explain the following :
(i) Wien effect
(ii) Electrophoretic effect.
Or
(b) Discuss the Debye-Huckel theory of mean ionic activity co-efficient.
17. (a) Write a brief note on :
(i) Evan's diagram
(ii) Transfer co-efficient and its significance.
Or
(b) Discuss about Butler – Volmer equation for multi step electron transfer reaction.