



**KD-6421**

**B. E. II (Sem. IV) (Chemical) Examination**  
**December - 2012**  
**Engineering Chemistry - III**  
*(Old Scheme)*

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

नीचे दशविवेक निशानीवाणी विगतो उत्तरवडी पर अवश्य लखवी.  
Fillup strictly the details of signs on your answer book.

Name of the Examination :  
B. E. 2 (Sem. 4) (Chemical)

Name of the Subject :  
Engineering Chemistry - 3 (Old)

Subject Code No. : 6 4 2 1 Section No. (1, 2,.....): 1&2

Seat No. :

Student's Signature

- (2) Give reactions and neat diagrams whenever necessary.  
(3) Q. 1 and 4 are compulsory and carries 20 marks each.  
(4) Q. 2, 3 and 5, 6 are of 15 marks each.  
(5) Specify question nos. to the answer attempted.

**SECTION - I**

- 1 (a) Fill in the blanks : 5
- (1) The term of concentration of molecules of a gas or liquid at a solid surface is called \_\_\_\_\_ .  
(2) pH of solution is 3, the concentration of H<sup>+</sup> ion = \_\_\_\_\_ .  
(3) The multiple extraction is \_\_\_\_\_ efficient.  
(4) pOH = pKa + \_\_\_\_\_ .  
(5) pH = \_\_\_\_\_ .
- (b) Explain pH metric titration in detail. 5
- (c) Match : 5
- | A                          | B                     |
|----------------------------|-----------------------|
| (1) Intensive properties   | (a) NaCl              |
| (2) Extensive properties   | (b) NH <sub>3</sub>   |
| (3) Covalent compound      | (c) Freezing Point    |
| (4) Ionic compound         | (d) Internal Energy   |
| (5) Separation of Isotopes | (e) Thermal Diffusion |

- (d) Define : 5
- (1)  $H^+$  ion,
  - (2) Molar volume,
  - (3) Heat of reaction,
  - (4) Adsorption,
  - (5) Thermo chemistry,
  - (6) Acid
- 2 Answer any **three** : 15
- (1) Discuss and draw phase diagram of sulphur system.
  - (2) Explain the strength of acids and bases.
  - (3) Explain laws of photochemistry.
  - (4) Derive Vant Hoff isochore in detail.
- 3 Attempt any **three** : 15
- (1) Glass electrode
  - (2) Aston's Mass spectrograph
  - (3) Separation of isotopes
  - (4) Emulsion and Gel.

## SECTION - II

- 4 (a) Fill in the blanks : 10
- (1) For \_\_\_\_\_ component system at the triple point is monovariant.
  - (2) The \_\_\_\_\_ apparatus was derived by Berthelot to measure the heat of combustion of organic compounds.
  - (3) The greater the heat of fusion of a substance higher the magnitude of \_\_\_\_\_ forces.
  - (4) The enthalpy change when one mole of solid is directly converted to the gaseous state at a temperature below its melting point \_\_\_\_\_ .
  - (5) One Kilo Calorie = \_\_\_\_\_ Kilo Joule.
  - (6) The temperature coefficient is + Ve the nFE \_\_\_\_\_  
-  $\Delta H$ .
  - (7) The commonly secondary standard electrode is called \_\_\_\_\_ .
  - (8) Strength of acids depends on the tendency to release \_\_\_\_\_ when the acid is dissolved in water.
  - (9) Mathematical statement of 1<sup>st</sup> law is  
 $\Delta E = q -$  \_\_\_\_\_ .
  - (10) When solid/liquid system with the gas phase absent is called \_\_\_\_\_ .

- (b) Short answer questions : 10
- (a) What is eutectic temperature ?
  - (b) Explain phase.
  - (c) What is electron displacement ?
  - (d) Explain Heat of combustion.
  - (e) Define Entropy and Enthalpy.
- 5** Attempt any **three** : 15
- (a) Explain Molar Volume and Molar fraction in detail.
  - (b) Discuss Dipole moment in detail.
  - (c) What is heat of reaction and heat of formation ?
  - (d) Explain relative strength of acid and base.
- 6** Attempt any **five** : 15
- (a) Give note on covalent and coordination bond.
  - (b) What is pH ? Discuss Glass electrode.
  - (c) What is thermodynamics ? Explain Clapeyron-Clausius equation in detail.
  - (d) Discuss Hess's law of heat of summation.
  - (e) Explain theories of indicators in detail.
  - (f) Discuss free energy and maximum work function in detail.
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