19U208S (Pages: 2) Name……

Reg. No……

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2020

(CUCBCSS – UG)

(Supplementary/Improvement)

CC15U CHE2 C02 – PHYSICAL CHEMISTRY

(Chemistry - Complimentary Course)

(2015 to 2018 Admissions)

Time: Three Hours Maximum: 80 Marks

Section-A

Answer ***all*** questions. Each question carries 1 mark.

1. The most probable velocity of a gas varies inversely as square root of ……
2. In a SHE the concentration of H^+ ions is ……
3. The unit of force is ……
4. The relation connecting equivalent conductivity and concentration is ……
5. Entropy of CO at absolute zero is ……
6. The liquid boils when …… equals atmospheric pressure
7. Name the unit cell which resembles match box in its shape
8. Write an example for orthorhombic crystal ……
9. The law relating pressure of gas inversely proportional to volume is ……
10. Example for a closed system is ……

(10 x 1 = 10 Marks)

Section-B

Answer any ***seven*** questions. Each question carries 2 marks.

11. What are reference electrodes?
12. Calculate average velocity of N_2 molecules at 273 K
13. What are the deviations from ideal behaviour in the case of real gases?
14. What happens to surface tension with temperature?
15. Calculate the work done when 5g hydrogen expands from a volume of 1litre to a volume of 5 litres at 30^OC
16. What happens to specific conductance with dilution?
17. Aqueous solution of sodium carbonate is basic why?
18. Differentiate between extrinsic and intrinsic imperfections in crystals.

19. State Hentry`s law.

20. What is difference between ionic conduction and electronic conduction?

(7 x 2 = 14 Marks)

Section-C

Answer any ***four*** question. Each question carries 5 marks.

21. Explain Ostwald's dilution law.

22. What are buffer solution, illustrate with example and also application of Buffer solutions?

23. Discuss the relation between temperature and pressure of an adiabatic process.

24. Discuss the symmetry elements in crystals.

25. a) Explain the significance of Gibb`s free energy

    b) For a hypothetical reaction $A_2 + B_2 \leftrightarrow 2AB$, the ΔH and ΔS values are 65 kj / mol and 182 kj/mol respectively. Calculate the temperature at which the reaction attains equilibrium.

26. Explain Maxwell distribution of molecular velocities. What is the effect of temperature?

(4 x 5 = 20 Marks)

Section-D

Answer any ***two*** question. Each question carries 10 marks.

27) a) Derive Braggs equation and explain its applications (5 Marks)

    b) Calculate the EMF of a cell Zn/ $Zn^{2+}_{(0.01m)}$ // $Cu^{2+}_{(0.01m)}$/Cu at 25^0C. Given E^0 Zn/ Zn^{2+} = - 0.76V E^0 of Cu^{2+}/Cu = 0.34V (5 Marks)

28) a) State and explain Kohlrausch`s law and illustrate two application of the law (5 Marks)

    b) What are liquid crystals? How are they classified? Give three application of liquid crystals (5 Marks)

29) Derive Gibbs Helmholtz equation and explain its significance. (10 Marks)

30) What is the principle of conductometric titration? Discuss the titration curve for strong acid x strong base, strong acid x weak base and weak acid x weak base (10 Marks)

(2 x 10 = 20 Marks)

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