Reg. No…….. Name…… **21U631**

B. Sc. DEGREE END SEMESTER EXAMINATION - APRIL 2021

SEMESTER **–6: CHEMISTRY (CORE COURSE)**

COURSE: **15U6CRCHE11: PHYSICAL CHEMISTRY - III**

(Common for Regular 2018 admission & Improvement 2017/Supplementary 2017/ 2016 /2015 admissions)

Time: Three Hours Max Marks: 60

SECTION A

Answer all questions. Each question carries 1 mark

1. Give one example of a path function.
2. What is Gibbs-Helmholtz equation?
3. What is the unit of rate constant for the reaction having first order?
4. Represent Michaelis-Menten equation
5. What is the value of Joule –Thomson coefficient for an ideal gas?
6. Give an expression relating Kc, Kx and Kp
7. State zeroth law of thermodynamics.
8. The point at which ice exist in equilibrium with water vapour and liquid water. (1 × 8 = 8)

SECTION B

Answer any six questions. Each question carries 2 marks

9. Calculate the activation energy of a second order reaction having rate constant $1.6x10^{-4}dm^3mol^{-1}S^{-1}$ at 30^0C and $3.2x10^{-4}dm^3mol^{-1}S^{-1}$ at 40^0C .
10. Explain pseudo order reactions.
11. Sketch and label the phase diagram of Sulphur system.
12. Will all the substances have same entropy at 0K? Explain.
13. What is Joule Thomson Inversion Temperature?
14. Differentiate between order and molecularity.
15. Derive the integrated rate equation of first order reactions.
16. Calculate the maximum efficiency of an engine operating between 100^0C and 25^0C.

(2 × 6 = 12)

SECTION C

Answer any four questions. Each question carries 5 marks

17. Explain the phase diagram of a one component system.
18. Derive Gibbs Duhem equation.
19. Explain the variation of heat reaction with temperature at constant pressure.
20. Explain the physical significance of Entropy.
21. Represent Arrhenius Equation and derive integrated Arrhenius Equation
22. Briefly explain the Activated complex theory. (5 × 4 = 20)

SECTION D

Answer any two questions. Each question carries 10 marks

23. Explain (a) Collision theory (b) Lindemann theory for unimolecular reactions.
24. Derive Claypeyron-Clausius equation. Discuss its applications.
25. Explain (a) Hesses Law and its applications (b) Carnot cycle and calculation of its efficiency
26. Derive the rate law expression for the formation of HBr.

(10 x 2 = 20)

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