



**JX-003-001507**

Seat No. \_\_\_\_\_

**B. Sc. (Sem. V) (CBCS) Examination**

**October - 2019**

**C-503 : Physical & Analytical Chemistry**

**Faculty Code : 003**

**Subject Code : 001507**

Time : **2:30** Hours]

[Total Marks : **70**

1 Answer in one word : **20**

- (1) In Isothermal Expansion in Carnot cycle which terms is equal to zero.
- (2) Write Gibbs Helmholtz equation.
- (3)  $\Delta S(sys) + \Delta S(surr) = 0$  for \_\_\_\_\_ Process.
- (4) The value of entropy for a solid crystalline substance is equal to \_\_\_\_\_.
- (5) For liquid vapour equilibrium Clausius Clayperon equation is written as \_\_\_\_\_.
- (6) Define tie line with help of diagram.
- (7) Define Phase and write Phase rule equation.
- (8) Define simple cubic lattice.
- (9) The rock salt has a \_\_\_\_\_ cubic lattice.
- (10) Which liquid crystal is thread like.
- (11) Define Error.
- (12) Write the equation of Absolute error.
- (13) Write the significant number of 10.73.
- (14) What is the colour of precipitate of CdS in the mixture of Cd & Cu.
- (15) In separation of  $S^{-2}$ ,  $SO_3^{-2}$  and  $SO_4^{-2}$  when  $CdCO_3$  is added which radical gets first separated.

- (16) The concentration of sparingly soluble salt is \_\_\_\_\_.
- (17) Lambert's- Beer law is applicable to \_\_\_\_\_ solution.
- (18) Only those light which are absorbed by a reacting system can produce a chemical change. This law is given by \_\_\_\_\_
- (19) Which indicator is used in Fajan's method for the titration of chlorine with  $\text{AgNO}_3$ .
- (20)  $\text{KMnO}_4$  is \_\_\_\_\_ type of indicator.

2 (a) Answer any **three** : 6

- (1) State any 2 statements of 2<sup>nd</sup> law of thermodynamics.
- (2) Explain effect of pressure on melting point of paraffin wax.
- (3) With the help of diagram show three component system consisting all three components.
- (4) What are the uses of Gibbs Helmholtz equation?
- (5) State the classification of liquid crystal.
- (6) At the melting point of a substance 840 J/mole heat is required at that time change of entropy is 1.2 J/mole/K. Calculate the melting point of the substance.

(b) Answer any **three** : 9

- (1) Derive Helmholtz equation.
- (2) Prove that decrease in work function is equal to max. work obtained.
- (3) Explain entropy as a function of temperature and volume.
- (4) What is the difference between Smectic and Nematic Liquid Crystal?
- (5) Explain two pair partially miscible liquid with neat diagram.
- (6) Explain the law of symmetry.

(c) Answer any **two** : **10**

- (1) Derive Vanthoff equation.
- (2) Explain Carnot cycle.
- (3) Explain one pair partially miscible liquid with neat diagram.
- (4) Explain Law of mass action based on thermodynamics.
- (5) Explain Laws of constancy of Interfacial angles and law of Rationality of Indices.

**3** (a) Answer any **three** : **6**

- (1) Explain separation of Chloride, bromide and iodide ions.
- (2) Short note on Grotthus Draper law.
- (3) Define Standard solution and Back titration.
- (4) What is primary standard? Explain with suitable examples.
- (5) Explain Standard Deviation.
- (6) The amount of gold found in an ore are 6.62, 6.02, 6.32, 6.48 and 6.21. Find the mean value.

(b) Answer any **three** : **9**

- (1) Explain Q test.
- (2) The % amount of iron observed by analyst of iron ore are 7.08, 7.21, 7.12, 7.09, 7.16, 7.14, 7.18 and 7.11. Calculate mean value and standard deviation.
- (3) Explain iodimetry titration.
- (4) Discuss advantages and disadvantages of starch indicator.
- (5) Explain separation of  $S^{-2}$ ,  $SO_3^{-2}$  and  $SO_4^{-2}$
- (6) Explain Lambert-Beer's law.

(c) Answer any **two** :

**10**

- (1) Explain spectrophotometer estimation of (i) Lacking of absorption by product and (ii) Lacking of absorbance by reactant and reagents.
- (2) Explain the separation of  $\text{PO}_4^{-3}$ ,  $\text{ASO}_3^{-3}$  and  $\text{ASO}_4^{-3}$  in detail by qualitative analysis.
- (3) Explain titration curve for strong acid and strong base based on neutralization titration.
- (4) Explain Gaussian curve with neat diagram.
- (5) What is precipitation titration? Explain Mohr's method.

---