

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV(NEW) EXAMINATION – WINTER 2022****Subject Code:2140501****Date:17-12-2022****Subject Name:Physical And Inorganic Chemistry****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed. +

- Q.1** (a) Compare the properties of  $\alpha$ ,  $\beta$  and  $\gamma$  particles **03**
- (b) What do you understand by Hess's law of constant heat summation and its applications? **04**
- (c) What is chromatography? Give its principle and write a note on gas chromatography (GC) instrument and its working. **07**
- Q.2** (a) Enlist the types of chemical bond with suitable examples. **03**
- (b) Write the important properties of steel. **04**
- (c) What do you understand by reduced phase rule? Construct a neat phase diagram of zinc-cadmium eutectic system and discuss its salient features. **07**
- OR**
- (c) Write classification and applications of propellant. **07**
- Q.3** (a) Define phase, component & degree of freedom **03**
- (b) Write a note on electrochemical cell with appropriate diagram. **04**
- (c) Write classification, preparation and uses of explosives **07**
- OR**
- Q.3** (a) Explain hydrogen bonding and its types with suitable examples. **03**
- (b) What is the basic principle used in conductometry titration? Briefly discuss any two of its applications. **04**
- (c) What is a nuclear reactor? With a neat diagram of light – water reactor, describe its main parts briefly. **07**
- Q.4** (a) Give differences between order and molecularity of reaction **03**
- (b) Draw the phase diagram of water system. Discuss its salient features. **04**
- (c) Discuss principle, instrumentation and working of UV-VIS spectroscopy **07**
- OR**
- Q.4** (a) Differentiate between Nuclear fission & Nuclear fusion reaction. **03**
- (b) Describe any one method for extraction of aluminum from its ore. **04**
- (c) Develop Handerson – Hasselbatch equation for buffer solutions. **07**
- Q.5** (a) What do you understand by salt bridge? **03**
- (b) Write a note on Glass electrode **04**
- (c) Write a note on Molecular Orbital Theory with one example. **07**
- OR**
- Q.5** (a) Explain allotropy with suitable examples. **03**
- (b) Write about heat of reaction and heat of combustion **04**

(c) Discuss Differential thermal analysis and its applications.

07

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