

Total No. of Questions: 6

Total No. of Printed Pages: 2

Enrollment No.....



Faculty of Science  
End Sem Examination Dec-2023

BT3CO01 Chemistry -I

Programme: B.Sc.

Branch/Specialisation: Biotechnology

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1 i. Shape of S-orbital is- **1**  
(a) Spherical (b) Dumbell (c) Square (d) Double dumbell
- ii. Which electromagnetic radiation has highest wavelength? **1**  
(a) X-rays (b) Visible (c) Infra red (d) Radiowave
- iii. In which of the following substances will hydrogen bond be strongest? **1**  
(a) HCl (b) H<sub>2</sub>O (c) HI (d) H<sub>2</sub>S
- iv. Hybridization in BeF<sub>2</sub> is... **1**  
(a) sp (b) sp<sup>2</sup> (c) sp<sup>3</sup> (d) sp<sup>3</sup>d
- v. Which of the following is an intensive property of a thermodynamic system? **1**  
(a) Temperature (b) Mass  
(c) Energy (d) Volume
- vi. In which of the following systems does mass transfer occur across the system boundary? **1**  
(a) Isolated system (b) Closed system  
(c) Open system (d) None of these
- vii. Substances that decrease the activity of a catalyst are known as: **1**  
(a) Controllers (b) Promoters  
(c) Poisons (d) Initiators
- viii. When a catalyst is used in a reaction which of the following changes? **1**  
(a) Heat of reaction (b) Product of reaction  
(c) Equilibrium constant (d) Activation energy

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- ix. pH value of milk is: **1**  
(a) 2.4 (b) 3.2 (c) 6.6 (d) 10
- x. What do acids do to red litmus paper? **1**  
(a) Remains red (b) Turn it blue  
(c) Turn it yellow (d) Turn it green
- Q.2 i. Write a note on Bohr's atomic model. **4**  
ii. Write a detail note on quantum Numbers. **6**  
OR iii. Write Short note on: **6**  
(a) Hund's Rule (b) Aufbau Principle
- Q.3 i. Write a note on Fajan's Rule. **4**  
ii. Write difference between Ionic bonding and Covalent bonding. **6**  
OR iii. What is Hybridization? Explain hybridization in Trigonal Planar compound with suitable example. **6**
- Q.4 i. Write note on: **4**  
(a) State of system (b) State variables  
ii. Explain the laws of thermodynamics. **6**  
OR iii. Write a detail note on thermodynamic processes. **6**
- Q.5 i. Write the characteristics of catalytic reactions. **4**  
ii. Define catalysis. Write about types of catalysis. **6**  
OR iii. Explain enzyme catalysis in detail. **6**
- Q.6 Attempt any two: **5**  
i. Define electrolytes. Write about types of electrolytes with example. **5**  
ii. Define degree of ionization. Write the factors affecting it. **5**  
iii. Write short note on: **5**  
(a) pH scale (b) Common ion effect

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# Scheme of Marking



Faculty of Science

End Sem Examination Dec-2023

Chemistry -I (T) - BT3CO01 (T)

Programme: B.Sc.

Branch/Specialisation:

**Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.**

Q.1	i)	Shape of S-orbital is	1
	a)	Spherical	
	ii)	Which electromagnetic radiation has highest wavelength?	1
	d)	Radiowave	
	iii)	In which of the following substances will hydrogen bond be strongest:	1
	b)	H <sub>2</sub> O	
	iv)	Hybridization in BeF <sub>2</sub> is...	1
	a)	sp	
	v)	Which of the following is an intensive property of a thermodynamic system.	1
	a)	Temperature	
	vi)	In which of the following systems does mass transfer occur across the system boundary?	1
	c)	Open system	
	vii)	Substances that decrease the activity of a catalyst are known as:	1
	c)	Poisons	
	viii)	When a catalyst is used in a reaction which of the following changes:	1
	d)	Activation energy	
	ix)	pH value of milk is:	1
	c)	6.6	
	x)	What do acids do to red litmus paper?	1
	a)	Remains red	
Q.2	i.	note on Bohr's atomic model-	4
	ii.	Quantum Numbers-	6

OR	iii.	Types- 4 marks Write Short note on:	6
	a)	Hund's Rule – 3 marks	
	b)	Aufbau Principle- 3 marks	
Q.3	i.	Write a note on Fajan's Rule. – 4 marks	4
	ii.	Write difference between Ionic bonding and Covalent bonding.- 6 marks	6
OR	iii.	What is Hybridization? – 2 marks Explain hybridization in Trigonal Planar compound with suitable example.- 4 marks	6
Q.4	i.	Write note on :	4
	a)	State of system – 2 marks	
	b)	State variables- 2 marks	
	ii.	Explain the Laws of thermodynamics.- 6 marks	6
OR	iii.	Write a detail note on Thermodynamic Processes- 6 marks	6
Q.5	i.	Write the characteristics of catalytic reactions.- 4 marks	4
	ii.	Define Catalysis.- 2 marks Write about types of catalysis.- 4 marks	6
OR	iii.	Explain Enzyme catalysis in detail.- 6 marks	6
Q.6		Attempt any two:	
	i.	Define electrolytes. – 2 marks Write about types of electrolytes with example.- 3 mark	5
	ii.	Define degree of ionization. – 2 marks Write the factors affecting it.- 3 marks	5
	iii.	Write short note on:	5
	a)	pH scale – 2.5 marks	
	b)	Common ion effect- 2.5 marks	

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