IIT JAM 2026 Chemistry Question Paper with Solutions

Time Allowed :3 Hour	**Maximum Marks :**100	**Total Questions :**60

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination is of 3 hours duration. There are a total of 60 questions carrying 100 marks. The entire paper is divided into three sections, A, B and C. All sections are compulsory. Questions in each section are of different types.
2. Section A contains a total of 30 Multiple Choice Questions (MCQ). Each MCQ type question has four choices out of which only one choice is the correct answer. Questions Q.1 – Q.30 belong to this section and carry a total of 50 marks. Q.1 – Q.10 carry 1 mark each and Questions Q.11 – Q.30 carry 2 marks each.
3. Section B contains a total of 10 Multiple Select Questions (MSQ). Each MSQ type question is similar to MCQ but with a difference that there will be more than one choices that are correct out of the four given choices. The candidate gets full credit if he/she selects all the correct answers only and no wrong answers. Questions Q.31 – Q.40 belong to this section and carry 2 marks each with a total of 20 marks.
4. Section C contains a total of 20 Numerical Answer Type (NAT) questions. For these NAT type questions, the answer is a real number which needs to be entered using the virtual keyboard on the monitor. No choices will be shown for these type of questions. Questions Q.41 – Q.60 belong to this section and carry a total of 30 marks. Q.41 – Q.50 carry 1 mark each and Questions Q.51 – Q.60 carry 2 marks each.
5. In all sections, questions not attempted will result in zero mark. In Section A (MCQ), wrong answer will result in NEGATIVE marks. For all 1-mark questions, 1/3 marks will be deducted for each wrong answer. For all 2-mark questions, 2/3 marks will be deducted for each wrong answer. In Section B (MSQ), there is NO NEGATIVE and NO PARTIAL marking provisions. There is NO NEGATIVE marking in Section C (NAT) as well.
6. Only Virtual Scientific Calculator is allowed. Charts, graph sheets, tables, cellular phone or other electronic gadgets are NOT allowed in the examination hall.
7. A Scribble Pad will be provided for rough work.

1. Find the number of P–O–P (pyrophosphate) bonds present in P_4O_8.

---

2. Determine the shape of ClF_3 **using VSEPR theory.**

3. List the compounds of Xenon having one lone pair on the central atom.

---

4. Write the van der Waals equation and explain the van der Waals isotherm (P–V curve).

---

5. Langmuir isotherm

(A) Multilayer adsorption
(B) Very high temperature θ vs P curve with intercept
(C) Very low temperature θ vs P curve with slope
(D) Reciprocal form gives $\theta = \dfrac{KP}{1+KP}$

---

6. Find the interplanar spacing d_{hkl} (in Å) using Bragg's law.
Given: $n = 1$, $\lambda = 1.54\,\text{Å}$
Use Bragg's law: $n\lambda = 2d\sin\theta$.

---

7. For the reaction:

$$N_2O_3(g) \rightarrow NO(g) + NO_2(g)$$

If the degree of dissociation is $\alpha = 0.2$, find Δn_g and total number of moles at equilibrium (starting with 1 mole).

---

8. The radioactive decay is given as:

$$^{238}_{92}U \rightarrow ^{210}_{82}Pb + 7\alpha + x\beta^-.$$

Find the value of x.

---

9. Among the following compounds of Xenon, identify those having exactly one lone pair on Xenon:
XeF_2, XeO_2F_2, XeO_3, XeO_3F_2, $XeOF_2$.

10. Isothermal compressibility of an ideal gas

$$-\frac{1}{V}\left(\frac{dV}{dP}\right)_T$$

is equal to

(A) $\frac{nR}{P}$
(B) nR
(C) R
(D) $\frac{1}{P}$

---

11. Which of the following has the highest melting point?

(A) LiBr
(B) NaBr
(C) $MgBr_2$
(D) $AlBr_3$

---

12. Compare the M–C bond length in the following complexes:
$Na_2[Mn(CO)_4], \quad Na[Mn(CO)_5], \quad Na[Mn(CO)_6].$

---

13. Given $C_p = a + bT$
$a = 19.5, \quad b = 0.042, \quad n = 1$ mole
Temperature changes from $27°C$ **to** $327°C$.
Find ΔH.

---

14. T-shape geometry is shown by

(A) XeF_2
(B) SO_2
(C) IO_4^-
(D) BrF_3

---

15. Which of the following has tetrahedral coordination?

(A) CdI_2
(B) CsCl
(C) ZnS (sphalerite)
(D) ZnS (wurtzite)
