

Exercise – I (JEE-Main Pattern)

SECTION-A

- This section contains **TWENTY** questions.
- Each question has **FOUR** options (1), (2), (3) and (4). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :

Full Marks : +4, if only the bubble corresponding to the correct option is darkened.

Zero Marks : 0, if none of the bubbles is darkened.

Negative Marks : -1 in all other cases

- One atomic mass unit in kilogram is
(1) $1/N_A$ (2) $12 / N_A$ (3) $1/1000 N_A$ (4) $1000 / N_A$
CBM001
- A gaseous mixture contains CO_2 (g) and N_2O (g) in a 2 : 5 ratio by mass. The ratio of the number of molecules of CO_2 (g) and N_2O (g) is
(1) 5 : 2 (2) 2 : 5 (3) 1 : 2 (4) 5 : 4
CBM002
- Which of the following contain largest number of carbon atoms?
(1) 15 gm ethane, C_2H_6 (2) 40.2 gm sodium oxalate, $\text{Na}_2\text{C}_2\text{O}_4$
(3) 72 gm glucose, $\text{C}_6\text{H}_{12}\text{O}_6$ (4) 35 gm pentene, C_5H_{10}
CBM003
- The number of hydrogen atoms in 0.9 gm glucose, $\text{C}_6\text{H}_{12}\text{O}_6$, is same as
(1) 0.048 gm hydrazine, N_2H_4 (2) 0.17 gm ammonia, NH_3
(3) 0.30 gm ethane, C_2H_6 (4) 0.03 gm hydrogen, H_2
CBM004
- An iodized salt contains 0.5 % of NaI. A person consumes 3 gm of salt everyday. The number of iodide ions going into his body everyday is ($I = 127$)
(1) 10^{-4} (2) 6.02×10^{-4} (3) 6.02×10^{19} (4) 6.02×10^{23}
CBM005
- The percentage by mole of NO_2 in a mixture of NO_2 (g) and NO (g) having average molecular mass 34 is :
(1) 25% (2) 20% (3) 40% (4) 75%
CBM006
- The number of carbon atoms present in a signature, if a signature written by carbon pencil, weighing 1.2×10^{-3} g is
(1) 12.04×10^{20} (2) 6.02×10^{19} (3) 3.01×10^{19} (4) 6.02×10^{20}
CBM007
- The average atomic mass of a mixture containing 79 mole % of ^{24}Mg and remaining 21 mole % of ^{25}Mg and ^{26}Mg , is 24.31. % mole of ^{26}Mg is
(1) 5 (2) 20 (3) 10 (4) 15
CBM008

9. If $1/2$ moles of oxygen combine with aluminium to form Al_2O_3 then weight of Aluminium metal used in the reaction is (Al = 27)
 (1) 27 g (2) 18 g (3) 54 g (4) 40.5 g CBM009
10. The volume occupied by 4.4 g of CO_2 at STP is
 (1) 22.7 L (2) 2.27 L (3) 0.227 L (4) 0.1 L CBM010
11. Which of the following sets of quantum numbers represent an impossible arrangement :
 (1) $n = 3, l = 2, m = -2, m_s = \frac{1}{2}$ (2) $n = 4, l = 0, m = 0, m_s = \frac{1}{2}$
 (3) $n = 3, l = 2, m = -3, m_s = \frac{1}{2}$ (4) $n = 5, l = 3, m = 0, m_s = \frac{1}{2}$ CAS012
12. The number of sodium atoms in 2 moles of sodium ferrocyanide $Na_4[Fe(CN)_6]$ is :-
 (1) 12×10^{23} (2) 26×10^{23} (3) 34×10^{23} (4) 48×10^{23} CBM012
13. Number of neutrons present in 1.7 grams of ammonia is -
 (1) N_A (2) $N_A/10 \times 4$ (3) $(N_A/10) \times 7$ (4) $N_A \times 10 \times 7$ CBM013
14. The decreasing order of energy of the 3d, 4s, 3p, 3s orbitals is :
 (1) $3d > 3s > 4s > 3p$ (2) $3s > 4s > 3p > 3d$
 (3) $3d > 4s > 3p > 3s$ (4) $4s > 3d > 3s > 3p$ CAS014
15. The total number of protons in 10 g of calcium carbonate is ($N_A = 6.023 \times 10^{23}$)
 (1) 1.5057×10^{24} (2) 2.0478×10^{23}
 (3) 3.0115×10^{24} (4) 4.0956×10^{24} CBM015
16. A compound of X and Y has equal masses of them. If their atomic weights are 30 and 20 respectively. Molecular formula of that compound (its mol. wt. is 120) could be -
 (1) X_2Y_2 (2) X_3Y_3 (3) X_2Y_3 (4) X_3Y_2 CBM016
17. A hydrocarbon contains 80% of carbon by mass, and its V.D. = 15. Then the hydrocarbon is -
 (1) CH_4 (2) C_2H_4 (3) C_2H_6 (4) C_2H_2 CBM017
18. Which of the following compounds has same empirical formula as that of glucose:-
 (1) CH_3CHO (2) CH_3COOH (3) CH_3OH (4) C_2H_6 CBM018
19. If $1/2$ moles of oxygen combine with aluminium to form Al_2O_3 then weight of Aluminium metal used in the reaction is (Al = 27)-
 (1) 27 g (2) 18 g (3) 54 g (4) 40.5 g CBM019
20. The moles of O_2 required for reacting with 6.8 g of ammonia
 ($\dots NH_3 + \dots O_2 \rightarrow \dots NO + \dots H_2O$) is-
 (1) 5 (2) 2.5 (3) 1 (4) 0.5 CBM020

SECTION-B

- This section will have **TEN questions**. Candidate can choose to attempt any 5 questions out of these 10 questions. In case if candidate attempts more than 5 questions, first 5 attempted questions will be considered for marking.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value (Answer should be rounded off to the nearest integer).
- Answer to each question will be evaluated according to the following marking scheme:
 Full Marks : +4, if only correct answer is given.
 Zero Marks : 0, if no answer is given.
 Negative Marks : -1 for incorrect answer

1. Calculate mass (in gm) of O atoms in 6 gm CH_3COOH ? CBM021
2. Calculate mass of water (in gm) present in 499 gm $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$?
(Atomic mass : Cu = 63.5, S = 32, O = 16, H = 1) CBM022
3. The Kohinoor diamond was the largest diamond ever found. How many moles of carbon atom were present in it, if it is weight 3300 carat. [Given: 1 carat = 200 mg] CBM023
4. How many gm of HCl is needed for complete reaction with 21.75 gm MnO_2 ?
(Mn = 55, Cl = 35.5)
 $\text{HCl} + \text{MnO}_2 \longrightarrow \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$ CBM024
5. Calculate mass of phosphoric acid (in gm) required to obtain 53.4g pyrophosphoric acid.
 $2\text{H}_3\text{PO}_4 \rightarrow \text{H}_4\text{P}_2\text{O}_7 + \text{H}_2\text{O}$ CBM025
6. The action of bacteria on meat and fish produces a poisonous compound called cadaverine. As its name and origin imply, it stinks! It is 58.77% C, 13.81 % H, and 27.42 % N. Its molar mass is 102 g/mol. If the molecular formula of cadaverine is $\text{C}_x\text{H}_y\text{N}_z$ then find $y/(x + z)$. CBM026
7. Calculate the number of moles in 5.75 g of sodium. (Atomic mass of sodium = 23.) CBM027
8. Given the following empirical formulae and molecular weight, find the number which when multiplied to empirical formula will change it into molecular formula:
 Empirical formula Molecular weight
 CH_2 84 CBM028
9. How many grams of the chlorine elements must be taken to get 1 mol of the element ? CBM029
10. The density of liquid mercury is 13.6 g/cm^3 . How many moles of mercury are there in 1 litre of the metal ? (Atomic mass of Hg = 200) CBM030

Exercise – II (JEE-Main PYQs)

- The total number of orbitals associated with the principal quantum number 5 is :
[JEE (Main) 2016]
(1) 25 (2) 5 (3) 20 (4) 10
CAS036
- The most abundant elements by mass in the body of a healthy human adult are :
Oxygen (61.4%) ; Carbon (22.9%), Hydrogen (10.0%) ; and Nitrogen (2.6%). The weight which a 75 kg person would gain if all ^1H atoms are replaced by ^2H atoms is [JEE (Mains) 2017]
(1) 15 kg (2) 37.5 kg (3) 7.5 kg (4) 10 kg
CBM034
- The ratio of mass percent of C and H of an organic compound ($\text{C}_x\text{H}_y\text{O}_z$) is 6 : 1. If one molecule of the above compound ($\text{C}_x\text{H}_y\text{O}_z$) contains half as much oxygen as required to burn one molecule of compound C_xH_y completely to CO_2 and H_2O . The empirical formula of compound $\text{C}_x\text{H}_y\text{O}_z$ is [JEE (Mains) 2018]
(1) $\text{C}_2\text{H}_4\text{O}$ (2) $\text{C}_3\text{H}_4\text{O}_2$ (3) $\text{C}_2\text{H}_4\text{O}_3$ (4) $\text{C}_3\text{H}_6\text{O}_3$
CBM036
- An unknown chloro-hydrocarbon has 3.55% of chlorine. If each molecule of the hydrocarbon has one chlorine atom only; chlorine atoms present in 1 g of chloro-hydrocarbon are :
(Atomic wt. of Cl = 35.5 u; Avogadro constant = $6.023 \times 10^{23} \text{ mol}^{-1}$) [JEE (Mains) 2018]
(1) 6.023×10^{21} (2) 6.023×10^{23}
(3) 6.023×10^{20} (4) 6.023×10^9
CBM038
- For the following reaction, the mass of water produced from 445 g of $\text{C}_{57}\text{H}_{110}\text{O}_6$ is :
 $2\text{C}_{57}\text{H}_{110}\text{O}_6(\text{s}) + 163\text{O}_2(\text{g}) \longrightarrow 114\text{CO}_2(\text{g}) + 110 \text{H}_2\text{O}(\text{l})$ [JEE (Mains) 2019]
(1) 495 g (2) 490 g (3) 890 g (4) 445 g
CBM039
- 25 g of an unknown hydrocarbon upon burning produces 88 g of CO_2 and 9 g of H_2O . This unknown hydrocarbon contains. [JEE (Mains) 2019]
(1) 20g of carbon and 5 g of hydrogen (2) 24g of carbon and 1 g of hydrogen
(3) 18g of carbon and 7 g of hydrogen (4) 22g of carbon and 3 g of hydrogen
CBM042
- The 71st electron of an element X with an atomic number of 71 enters into the orbital : [JEE (Main) 2019]
(1) 4f (2) 6p (3) 6s (4) 5d
CAS039
- The quantum number of four electrons are given below :
I. $n = 4, l = 2, m_l = -2, m_s = -\frac{1}{2}$ II. $n = 3, l = 2, m_l = 1, m_s = +\frac{1}{2}$
III. $n = 4, l = 1, m_l = 0, m_s = +\frac{1}{2}$ IV. $n = 3, l = 1, m_l = 1, m_s = -\frac{1}{2}$
The correct order of their increasing energies will be – [JEE (Main) 2019]
(1) $\text{IV} < \text{III} < \text{II} < \text{I}$ (2) $\text{IV} < \text{II} < \text{III} < \text{I}$ (3) $\text{I} < \text{II} < \text{III} < \text{IV}$ (4) $\text{I} < \text{III} < \text{II} < \text{IV}$
CAS041

9. The number of orbitals associated with quantum numbers $n = 5$, $s = +\frac{1}{2}$ is :
[JEE (Main) 2020]
(1) 11 (2) 25 (3) 15 (4) 50
CAS044
10. 5 g of zinc is treated separately with an excess of
(a) dilute hydrochloric acid and
(b) aqueous sodium hydroxide.
The ratio of the volumes of H_2 evolved in these two reactions is : [JEE (Mains) 2020]
(1) 1 : 4 (2) 1 : 2 (3) 2 : 1 (4) 1 : 1
CBM043
11. Amongst the following statements, that which was not proposed by Dalton was :
[JEE (Mains) 2020]
(1) all the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass.
(2) chemical reactions involve reorganisation of atoms. These are neither created nor destroyed in a chemical reaction.
(3) when gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T & P.
(4) matter consists of indivisible atoms.
CBM044
12. Complete combustion of 1.80 g of an oxygen containing compound ($C_xH_yO_z$) gave 2.64 g of CO_2 and 1.08 g of H_2O . The percentage of oxygen in the organic compound is: [JEE (Main) 2021]
(1) 51.63 (2) 63.53 (3) 53.33 (4) 50.33
CBM045
13. The number of chlorine atoms in 20 mL of chlorine gas at STP is $______ \times 10^{21}$. (Round off to the Nearest Integer). [Assume chlorine is an ideal gas at STP
 $R = 0.083 \text{ L bar mol}^{-1} \text{ K}^{-1}$, $N_A = 6.023 \times 10^{23}$] [JEE (Main) 2021]
CBM047
14. Complete combustion of 3 g of ethane gives $x \times 10^{22}$ molecules of water. The value of x is _____. (Round off to the Nearest Integer).
[Use : $N_A = 6.023 \times 10^{23}$; Atomic masses in u : C : 12.0 ; O : 16.0 ; H : 1.0] [JEE (Main) 2021]
CBM048
15. 120 of an organic compound that contains only carbon and hydrogen gives 330g of CO_2 and 270g of water on complete combustion. The percentage of carbon and hydrogen, respectively are.
[JEE (Main) 2022]
(1) 25 and 75 (2) 40 and 60 (3) 60 and 40 (4) 75 and 25
CBM049
16. If a rocket runs on a fuel ($C_{15}H_{30}$) and liquid oxygen, the weight of oxygen required and CO_2 released for every litre of fuel respectively are: (Given: density of the fuel is 0.756 g/mL) [JEE (Main) 2022]
(1) 1188 g and 1296 g (2) 2376 g and 2592 g
(3) 2592g and 2376 g (4) 3429 g and 3142 g
CBM050

17. 0.5 g of an organic compound (X) with 60% carbon will produce _____ $\times 10^{-1}$ g of CO_2 on complete combustion. [JEE (Main) 2023]
CBM125
18. A solution is prepared by adding 2g of "X" of 1 mole of water. Mass percent of "X" in the solution is : [JEE (Main) 2023]
CBM126
- (1) 20% (2) 5% (3) 2% (4) 10%
19. For a metal ion, the calculated magnetic moment is 4.90 BM. This metal ion has _____ number of unpaired electrons. [JEE (Main) 2023]
CBM127
20. Arrange the following orbitals in decreasing order of energy ? [JEE (Main) 2023]
CBM128
- (A) $n = 3, l = 0, m = 0$
 (B) $n = 4, l = 0, m = 0$
 (C) $n = 3, l = 1, m = 0$
 (D) $n = 3, l = 2, m = 1$
- The correct option for the order is :
 (1) $B > D > C > A$ (2) $D > B > C > A$ (3) $A > C > B > D$ (4) $D > B > A > C$

Exercise - III (JEE Advanced Pattern)

SECTION-I

- This section contains **TEN** questions.
 - Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct.
 - For each question, darken the bubble corresponding to the correct option in the ORS.
 - For each question, marks will be awarded in one of the following categories:
 Full Marks : +3, if only the bubble corresponding to the correct option is darkened.
 Zero Marks : 0, if none of the bubbles is darkened.
 Negative Marks : -1, in all other cases
- A sample of pure Cu (4.00g) heated in a stream of oxygen for some time, gains in weight with the formation of black oxide of copper (CuO). The final mass is 4.90 g. What percent of copper remains unoxidized (Cu = 64)
 (A) 90 % (B) 10 % (C) 20 % (D) 80 % **CBM052**
 - The charge on 1 gram ions of Al^{3+} is :
 (A) $\frac{1}{27} \times N_A e$ coulomb (B) $\frac{1}{3} \times N_A e$ coulomb
 (C) $\frac{1}{9} \times N_A e$ coulomb (D) $3 \times N_A e$ coulomb **CBM054**
 - The % loss in weight after heating a pure sample of potassium chlorate (M. wt. 122.5) will be :
 (A) 12.25 (B) 24.50 (C) 39.17 (D) 49.0 **CBM057**
 - $\text{Na}_2\text{SO}_4 \cdot x\text{H}_2\text{O}$ has 50% H_2O . Hence, x is :
 (A) 4 (B) 5 (C) 6 (D) 8 **CBM058**
 - The simplest formula of a compound containing 50% of element X (atomic mass = 10) and 50% of the element Y (atomic mass = 20) by weight is :
 (A) XY (B) X_2Y (C) XY_2 (D) X_2Y_3 **CBM059**
 - A certain alkaloid has 70.8% carbon, 6.2% hydrogen, 4.1% nitrogen and the rest oxygen. What is its empirical formula :
 (A) $\text{C}_{20}\text{H}_{21}\text{NO}_4$ (B) $\text{C}_{20}\text{H}_{20}\text{NO}_4$ (C) $\text{C}_{21}\text{H}_{20}\text{NO}_3$ (D) $\text{C}_{20}\text{H}_{19}\text{NO}_3$ **CBM060**
 - The atomic weight of Cu is 63.546. There are only two naturally occurring isotopes of copper ^{63}Cu and ^{65}Cu . The natural abundance of the ^{63}Cu isotope must be approximately :
 (A) 10% (B) 30% (C) 50% (D) 72.7% **CBM061**
 - 1.5 gm mixture of SiO_2 and Fe_2O_3 on very strong heating leave a residue weighting 1.46 gm. The reaction responsible for loss of weight is

$$\text{Fe}_2\text{O}_3(\text{s}) \longrightarrow \text{Fe}_3\text{O}_4(\text{s}) + \text{O}_2(\text{g})$$
 What is the percentage by mass of Fe_2O_3 in original sample.
 (A) 80% (B) 20% (C) 40% (D) 60% **CBM062**

9. Statement-I : 16 g each O_2 and O_3 contains $\frac{N_A}{2}$ and $\frac{N_A}{3}$ atoms respectively.

Because

Statement-II : 16 g O_2 and O_3 contains same no. of atoms.

- (A) Statement-I is true, Statement-II is true; Statement-II is correct explanation for Statement-I.
 (B) Statement-I is true, Statement-II is true; Statement-II is NOT a correct explanation for statement-I
 (C) Statement-I is true, Statement-II is false
 (D) Statement-I is false, Statement-II is true

CBM063

10. Elements A and B form two compounds B_2A_3 and B_2A . 0.05 moles of B_2A_3 weight 9.0 g and 0.10 mole of B_2A weight 10 g. Calculate the atomic weight of A and B :-

- (A) 20 and 30 (B) 30 and 40 (C) 40 and 30 (D) 30 and 20

CBM101

SECTION-II

- This section contains **THREE** questions of matching type.
- This section contains **One** table (having 3 columns and 4 rows)
- Based on table, there are **THREE** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :

Full Marks : +3, if only the bubble corresponding to the correct option is darkened.

Zero Marks : 0, if none of the bubbles is darkened.

Negative Marks : -1 in all other cases

Column-I	Column-II	Column-III
(P) 60 gram sample of hydro carbon that contain 20% H and rest C	(1) %C = 40	(i) No. of atoms of C as well as O = $8N_A$
(Q) 240 gram urea	(2) %H = $\frac{20}{3}$	(ii) No. of C atoms = $4N_A$
(R) 120 gram acetic acid	(3) % O = $\frac{160}{3}$	(iii) No. of total atoms = $16N_A$
(S) 120 gram glucose	(4) % N = 46.7	(iv) No. of total atoms is 2 times of no. of H atom
11. Out of below correct matching is -	(A) P - 1 - I (B) P - 1 - ii (C) Q - 2 - iii (D) S - 2 - iv	CBM064
12. In which of following is incorrect -	(A) Q - 2 - iv (B) R - 3 - iv (C) P - 4 - iii (D) R - 1 - ii	CBM065
13. Out of below correct matching is -	(A) S - 4 - iv (B) R - 1 - ii (C) P - 4 - iii (D) P - 2 - ii	CBM066

SECTION-III

- This section contains **TWO** questions.
- Each question has matching lists.** The codes for the lists have choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**
- For each question, marks will be awarded in one of the following categories :
Full Marks : +3 If only the bubble corresponding to the correct option is darkened.
Zero Marks : 0 If none of the bubbles is darkened.
Negative Marks : -1 In all other cases

14. One type of artificial diamond (commonly called YAG for yttrium aluminium garnet) can be represented by the formula $Y_3Al_5O_{12}$. [Y = 89, Al = 27]

Column I (Element)	Column II (Weight percentage)
(A) Y (P)	22.73%
(B) Al (Q)	32.32%
(C) O (R)	44.95%
(A) (A) → R, (B) → P, (C) → Q	
(B) (A) → P, (B) → P, (C) → R	
(C) (A) → P, (B) → R, (C) → Q	
(D) (A) → Q, (B) → P, (C) → P	

CBM067

15. The recommended daily dose is 17.6 milligrams of vitamin C (ascorbic acid) having formula $C_6H_8O_6$. Match the following. Given : $N_A = 6 \times 10^{23}$

Column I	Column II
(A) O-atoms present in daily dose	(P) 10^{-4} mole
(B) Moles of vitamin C in 1 gm of vitamin C	(Q) 5.68×10^{-3}
(C) Moles of vitamin C that should be consumed daily	(R) 3.6×10^{20}
(A) (A) → P, (B) → Q, (C) → R	
(B) (A) → Q, (B) → R, (C) → P	
(C) (A) → R, (B) → Q, (C) → P	
(D) (A) → R, (B) → P, (C) → Q	

CBM068

SECTION-IV

- This section contains **FIVE** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the **second decimal place**; e.g. 6.25, 7.00, -0.33, -0.30, 30.27, -127.30, if answer is 11.36777..... then both 11.36 and 11.37 will be correct).
- Answer to each question will be evaluated according to the following marking scheme:
Full Marks : +3 If ONLY the correct numerical value is entered as answer.
Zero Marks : 0 In all other cases.

16. Mass % of oxygen in monovalent metal carbonate is 48%. If the number of atoms of metal present in 5mg of this metal carbonate sample is $y \times 10^{19}$ then value of y is ($N_A = 6.022 \times 10^{23}$).

CBM069

17. $P_4S_3 + 8O_2 \longrightarrow P_4O_{10} + 3SO_2$

Calculate mass in gm of P_4S_3 is required to produce at least 9.6 gm of each product. (P = 31, S = 32)

CBM070

18. Minimum number of electrons having $m_s = \left(-\frac{1}{2}\right)$ in Cr is “_____”.

CBM129

19. How many elements are possible for the 1st period of periodic table if azimuthal quantum number can have integral values from 0 to $(n + 1)$. [n = shell number & other rules are remaining same to form periodic table.

CBM130

20. Find number of unpaired electrons when Fe does not follow $(n + \ell)$ rule and filling of electron takes place shell after shell and Hund's rule is also not obeyed.

CBM131

Exercise - IV (JEE Advanced PYQs)

1. A student performs a titration with different burettes and finds titre values of 25.2 mL, 25.25 mL, and 25.0 mL. The number of significant figures in the average titre value is :-
[JEE (Advanced) 2010]
CBM071
2. The maximum number of electrons that can have principal quantum number, $n = 3$, and spin quantum number, $m_s = -1/2$, is
[JEE (Advanced) 2011]
CBM132
3. In an atom, the total number of electrons having quantum numbers $n=4$, $|m_l| = 1$ and $m_s = \frac{1}{2}$ is:
[JEE (Advanced) 2014]
CBM133
4. If the value of Avogadro number is $6.023 \times 10^{23} \text{ mol}^{-1}$ and the value of Boltzmann constant is $1.380 \times 10^{-23} \text{ JK}^{-1}$, then the number of significant digits in the calculated value of the universal gas constant is
[JEE (Advanced) 2014]
CBM072
5. Not considering the electronic spin the degeneracy of the second excited state ($n = 3$) of H-atom is 9, where the degeneracy of the second excited state of H^- is
[JEE (Advanced) 2015]
CBM134
6. The ammonia prepared by treating ammonium sulphate with calcium hydroxide is completely used by $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$ to form a stable coordination compound. Assume that both the reactions are 100% complete. If 1584 g of ammonium sulphate and 952g of $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$ are used in the preparation, the combined weight (in grams) of gypsum and the nickel-ammonia coordination compound thus produced is ____.
(Atomic weights in g mol^{-1} : $\text{H} = 1$, $\text{N} = 14$, $\text{O} = 16$, $\text{S} = 32$, $\text{Cl} = 35.5$, $\text{Ca} = 40$, $\text{Ni} = 59$)
 $(\text{NH}_4)_2\text{SO}_4 + \text{Ca}(\text{OH})_2 \longrightarrow \text{CaSO}_4 \cdot 2\text{H}_2\text{O} + 2\text{NH}_3$
 $\text{NiCl}_2 \cdot 6\text{H}_2\text{O} + 6\text{NH}_3 \longrightarrow [\text{Ni}(\text{NH}_3)_6]\text{Cl}_2 + 6\text{H}_2\text{O}$
[JEE (Advanced) 2018]
CBM073
7. Galena (an ore) is partially oxidized by passing air through it at high temperature. After some time, the passage of air is stopped, but the heating is continued in a closed furnace such that the contents undergo self-reduction. The weight (in kg) of Pb produced per kg of O_2 consumed is ____ . (Atomic weights in g mol^{-1} : $\text{O} = 16$, $\text{S} = 32$, $\text{Pb} = 207$)
[JEE (Advanced) 2018]
CBM074

Answer Key

EXERCISE - I (JEE-Main Pattern)

Section-A	Q.	1	2	3	4	5	6	7	8	9	10
	A.	3	2	4	3	3	1	2	3	2	2
Section-B	Q.	11	12	13	14	15	16	17	18	19	20
	A.	3	4	3	3	3	3	3	2	2	4
Section-B	Q.	1	2	3	4	5	6	7	8	9	10
	A.	3	180	55	36	59	2	0	6	71	68

EXERCISE - II (JEE-Main PYQs)

Question	1	2	3	4	5	6	7	8	9	10
Answer	1	3	3	3	1	2	4	2	2	4
Question	11	12	13	14	15	16	17	18	19	20
Answer	3	3	1	18	4	3	11	4	4	2

EXERCISE - III (JEE Advanced Pattern)

Section-I	Q.	1	2	3	4	5	6	7	8	9	10
	A.	B	D	C	D	B	B	D	A	D	C
Section-II	Q.	11	12	13							
	A.	D	C	B							
Section-III	Q.	14	15								
	A.	A	C								
Section-IV	Q.	16	17	18	19	20					
	A.	6.02	11.00	9	8	0					

Exercise - IV (JEE Advanced PYQs)

Question	1	2	3	4	5	6	7	
Answer	3	9	6	4	3	2992	6.47	