

# CUET 2026 May 18 Shift 2 Chemistry

## Question Paper (Memory-Based) with Solutions

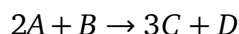
Conducted by National Testing Agency (NTA)



### General Instructions

- (i) The examination will be conducted in Computer-Based Test (CBT) mode.
- (ii) Each question carries +5 marks for correct answer and -1 mark for wrong answer.
- (iii) The total number of questions are 50.
- (iv) Duration of the exam is 1 hour (60 minutes).

#### 1. For the reaction



Which of the following does not express the reaction rate?

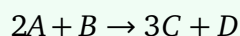
- (A)  $-\frac{d[B]}{dt}$
- (B)  $\frac{d[D]}{dt}$
- (C)  $-\frac{1}{2} \frac{d[A]}{dt}$
- (D)  $\frac{1}{3} \frac{d[C]}{dt}$

**Correct Answer:** (A)  $-\frac{d[B]}{dt}$

#### Solution:

**Step 1:** Write the rate expression.

For the reaction:



Rate of reaction is:

$$\text{Rate} = -\frac{1}{2} \frac{d[A]}{dt} = -\frac{d[B]}{dt} = \frac{1}{3} \frac{d[C]}{dt} = \frac{d[D]}{dt}$$

**Step 2: Compare with given options.**

Option (2):

$$\frac{d[D]}{dt}$$

is correct.

Option (3):

$$-\frac{1}{2} \frac{d[A]}{dt}$$

is correct.

Option (4):

$$\frac{1}{3} \frac{d[C]}{dt}$$

is correct.

Option (1):

$$-\frac{d[B]}{dt}$$

should actually be:

$$-\frac{1}{1} \frac{d[B]}{dt}$$

Thus it is not properly normalized according to stoichiometric coefficient form.

**Step 3: Identify the incorrect expression.**

Therefore:

$$\boxed{\text{(A)} - \frac{d[B]}{dt}}$$

**Quick Tip:** For a reaction:



Reaction rate:

$$-\frac{1}{a} \frac{d[A]}{dt} = -\frac{1}{b} \frac{d[B]}{dt} = \frac{1}{c} \frac{d[C]}{dt} = \frac{1}{d} \frac{d[D]}{dt}$$

2. The oxidation potentials of  $A$  and  $B$  are

$$+2.37 \text{ V} \quad \text{and} \quad +1.66 \text{ V}$$

respectively. In chemical reactions

- (A)  $A$  will be replaced by  $B$
- (B)  $A$  will replace  $B$
- (C)  $A$  will not replace  $B$
- (D)  $A$  and  $B$  will not replace each other

**Correct Answer:** (B)  $A$  will replace  $B$

**Solution:**

**Step 1: Understand oxidation potential.**

Greater oxidation potential means greater tendency to:

lose electrons

Hence stronger reducing agent.

Given:

$$E_{\text{ox}}^{\circ}(A) = +2.37 \text{ V}$$

$$E_{\text{ox}}^{\circ}(B) = +1.66 \text{ V}$$

Thus:

$A$

has greater tendency to oxidize than:

$B$

**Step 2: Determine displacement tendency.**

A stronger reducing agent displaces a weaker reducing agent from its salt solution.

Since:

$$A > B$$

in oxidation tendency,

$A$

will replace:

$B$

**Step 3: Identify the correct option.**

Therefore:

(B) A will replace B

**Quick Tip:** Higher oxidation potential:

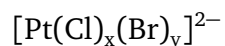
$\Rightarrow$

greater tendency to lose electrons

$\Rightarrow$

stronger reducing agent.

3. For which value of  $x$  and  $y$ , the following square planar compound shows geometrical isomers



- (A) 1, 3
- (B) 3, 1
- (C) 2, 2
- (D) 1, 1

**Correct Answer:** (C) 2, 2

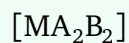
**Solution:**

**Step 1:** Recall geometrical isomerism in square planar complexes.

Square planar complexes show geometrical isomerism when:

two pairs of identical ligands are present

General form:

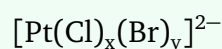


shows:

cis and trans isomers

**Step 2: Analyze the given complex.**

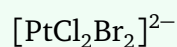
For:



geometrical isomerism is possible only when:

$$x = 2, \quad y = 2$$

Thus complex becomes:



which shows:

cis-trans isomerism

**Step 3: Identify the correct option.**

Therefore:

(C) 2, 2

**Quick Tip:** Square planar complexes of type:



show:

cis-trans geometrical isomerism

#### 4. Match the columns

Column-I		Column-II	
(A)	$\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$	(p)	gem-Dichloride
(B)	$\text{CH}_2 = \text{CHX}$	(q)	Vinylic halide
(C)	$\text{CH}_3\text{CHCl}_2$	(r)	vic-Dichloride
(D)	$\text{CH}_2\text{ClCH}_2\text{Cl}$	(s)	Allylic halide

(A)  $A \rightarrow (r)$ ,  $B \rightarrow (q)$ ,  $C \rightarrow (p)$ ,  $D \rightarrow (s)$

(B)  $A \rightarrow (q)$ ,  $B \rightarrow (p)$ ,  $C \rightarrow (s)$ ,  $D \rightarrow (r)$

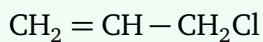
(C)  $A \rightarrow (s)$ ,  $B \rightarrow (q)$ ,  $C \rightarrow (p)$ ,  $D \rightarrow (r)$

(D)  $A \rightarrow (r)$ ,  $B \rightarrow (p)$ ,  $C \rightarrow (s)$ ,  $D \rightarrow (q)$

**Correct Answer:** (C)  $A \rightarrow (s)$ ,  $B \rightarrow (q)$ ,  $C \rightarrow (p)$ ,  $D \rightarrow (r)$

#### Solution:

**Step 1: Identify compound (A).**



contains halogen adjacent to double bond.

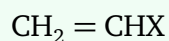
Hence it is:

allylic halide

Thus:

$A \rightarrow (s)$

**Step 2: Identify compound (B).**



has halogen directly attached to double bonded carbon.

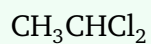
Hence:

vinylic halide

Thus:

$B \rightarrow (q)$

**Step 3: Identify compound (C).**

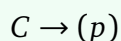


has both chlorine atoms attached to same carbon.

Hence:

gem-dichloride

Thus:



**Step 4: Identify compound (D).**

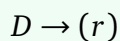


has chlorine atoms attached to adjacent carbons.

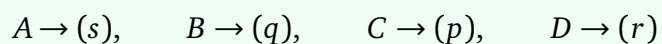
Hence:

vic-dichloride

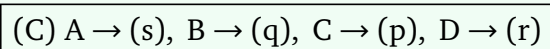
Thus:



**Step 5: Final matching.**



Therefore:



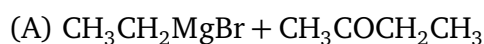
**Quick Tip:** gem-dihalide:

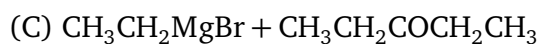
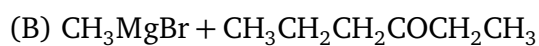
Both halogens on same carbon

vic-dihalide:

Halogens on adjacent carbons

**5. To prepare 3-ethylpentan-3-ol, the reagents needed are**





**Correct Answer:** (C)  $\text{CH}_3\text{CH}_2\text{MgBr} + \text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$

**Solution:**

**Step 1: Identify the target alcohol.**

Given alcohol:

3-ethylpentan-3-ol

Structure:



The carbon containing:

*OH*

is attached to:

3 ethyl groups

Hence it is a:

tertiary alcohol

**Step 2: Recall Grignard reaction.**

A ketone reacts with Grignard reagent:



to form a tertiary alcohol.

To obtain:

3-ethylpentan-3-ol

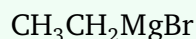
we require:



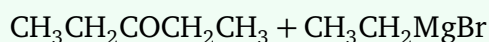
which is:

pentan-3-one

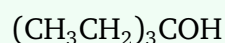
and:



**Step 3: Write the reaction.**



followed by hydrolysis gives:

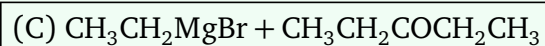


which is:

3-ethylpentan-3-ol

**Step 4: Identify the correct option.**

Therefore:



**Quick Tip:** Ketone + Grignard reagent:



tertiary alcohol after hydrolysis.

## 6. Chromosomes are made from

- (A) proteins
- (B) nucleic acids
- (C) proteins and nucleic acids
- (D) carbohydrates and nucleic acids

**Correct Answer:** (C) proteins and nucleic acids

**Solution:**

**Step 1: Recall the composition of chromosomes.**

Chromosomes are mainly composed of:

DNA and proteins

DNA is a:

nucleic acid

Proteins present are mainly:

histone proteins

**Step 2: Identify the correct option.**

Therefore chromosomes are made of:

proteins and nucleic acids

Hence:

(C) proteins and nucleic acids

**Quick Tip:** Chromosome:

DNA + Histone proteins

7. The electronic configuration of Cu(II) is

$3d^9$

whereas that of Cu(I) is

$3d^{10}$

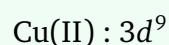
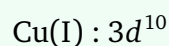
Which of the following is correct?

- (A) Cu(II) is more stable
- (B) Cu(I) is less stable
- (C) Cu(I) and Cu(II) are equally stable
- (D) Stability of Cu(I) and Cu(II) depends on nature of copper salts

**Correct Answer:** (D) Stability of Cu(I) and Cu(II) depends on nature of copper salts

**Solution:**

**Step 1: Compare the electronic configurations.**



Configuration:



is completely filled and generally stable.

**Step 2: Consider practical stability.**

Although:



has stable electronic configuration, its actual stability depends on:

the ligands and nature of the salt

Some compounds stabilize:



while others stabilize:



Thus stability depends on surrounding chemical environment.

**Step 3: Identify the correct option.**

Therefore:

(D) Stability of Cu(I) and Cu(II) depends on nature of copper salts

**Quick Tip:** Stability of oxidation states in transition metals depends on:

ligands, hydration energy and lattice energy

**8. On addition of small amount of  $KMnO_4$  to concentrated  $H_2SO_4$ , a green oily compound is obtained which is highly explosive in nature. Identify the compound from the following.**

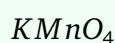
- (A)  $Mn_2O_7$
- (B)  $MnO_2$
- (C)  $MnSO_4$
- (D)  $Mn_2O_3$

**Correct Answer:** (A)  $Mn_2O_7$

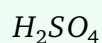
**Solution:**

**Step 1:** Recall the reaction of  $KMnO_4$  with concentrated  $H_2SO_4$ .

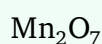
When:



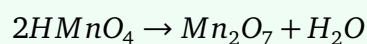
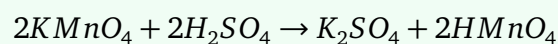
reacts with concentrated:



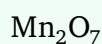
a dark green oily liquid is formed:



Reaction:

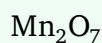


**Step 2:** Identify the explosive compound.



is highly unstable and explosive.

Thus the green oily liquid obtained is:



**Step 3:** Identify the correct option.

Therefore:

(A)  $Mn_2O_7$

**Quick Tip:**



is manganese heptoxide:

a dark green explosive liquid

9. Which of the following oxidation state is common for all lanthanoids?

- (A) +2
- (B) +3
- (C) +4
- (D) +5

**Correct Answer:** (B) +3

**Solution:**

**Step 1:** Recall the common oxidation state of lanthanoids.

Lanthanoids generally lose:

2 electrons from 6s

and:

1 electron from 5d or 4f

Thus the most stable and common oxidation state is:

+3

**Step 2:** Analyze other oxidation states.

Some lanthanoids may also show:

+2 or +4

but these are not common to all lanthanoids.

**Step 3:** Identify the correct option.

Therefore:

(B) + 3

**Quick Tip:** Most common oxidation state of lanthanoids:

+3

due to stable removal of:

$6s^2$

and one additional electron.

10. The magnetic nature of elements depends on the presence of unpaired electrons. Identify the configuration of transition element, which shows highest magnetic moment.

(A)  $3d^7$

(B)  $3d^5$

(C)  $3d^8$

(D)  $3d^2$

**Correct Answer:** (B)  $3d^5$

**Solution:**

**Step 1:** Recall the formula for magnetic moment.

Magnetic moment depends on number of unpaired electrons:

$$\mu = \sqrt{n(n+2)} \text{ BM}$$

where:

$n$  = number of unpaired electrons

**Step 2:** Find unpaired electrons in each configuration.

$3d^7 \Rightarrow 3$  unpaired electrons

$3d^5 \Rightarrow 5$  unpaired electrons

$3d^8 \Rightarrow 2$  unpaired electrons

$3d^2 \Rightarrow 2$  unpaired electrons

**Step 3: Identify highest magnetic moment.**

Maximum magnetic moment corresponds to maximum number of unpaired electrons.

Thus:

$3d^5$

has highest magnetic moment.

**Step 4: Identify the correct option.**

Therefore:

(B)  $3d^5$

**Quick Tip:** Greater the number of unpaired electrons:

$\Rightarrow$

greater the magnetic moment.