JEE: Mock test
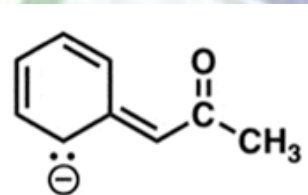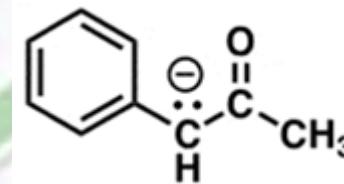
Part-2

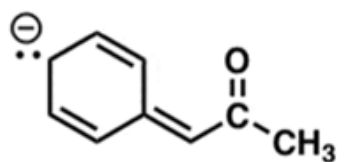# Chemistry Affinity
Conceptual, Real world, Happy Learning

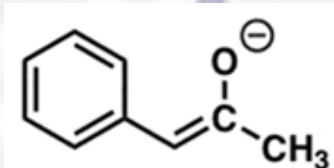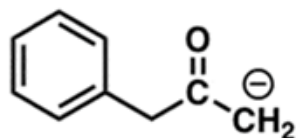# 1. Which of these molecules is not the resonance form of

2. Which of these molecules represents a pair of resonance forms?

A

H_3C—CH=CH—CH_3 ⟷ H_3C—CH=CH—CH_3

B

(cyclohexene) ⟷ (cyclohexadiene)

C

(methylcyclopentadienyl cation) ⟷ (methylcyclopentadienyl cation)

D

CH_3—C(=O)—NH_2 ⟷ CH_2=C(OH)—NH_2
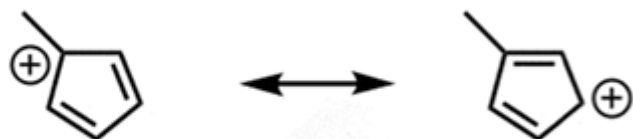
3. Which of these drawings represents a pair of resonance forms?

A.

B.

C.

D.

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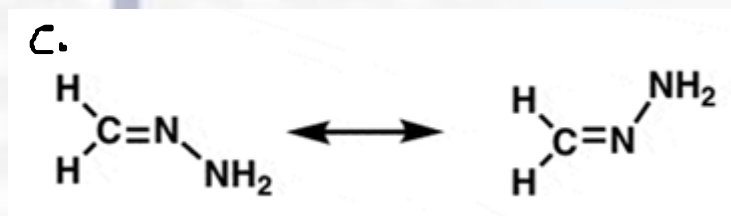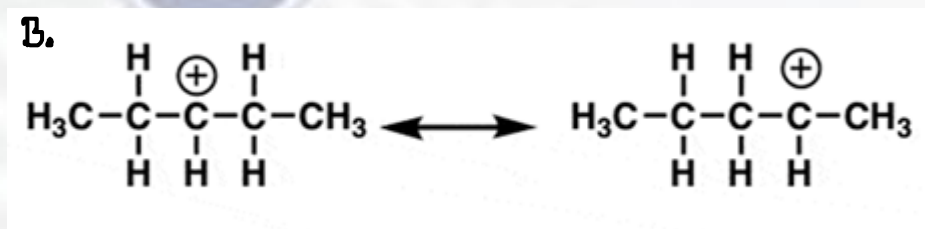
4. Which resonance form is most important?

① A ⟷ B

② A ⟷ B

③ A ⟷ B

5. For which of the following gaseous equilibrium at constant temperature, doubling the volume would cause a shift of equilibrium to the right
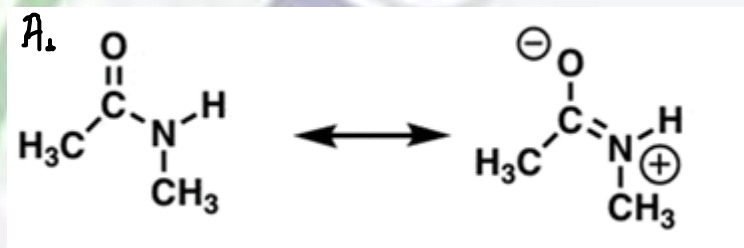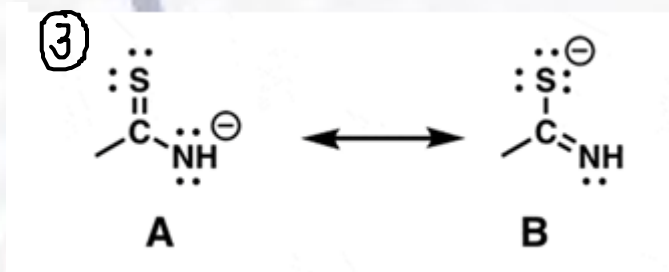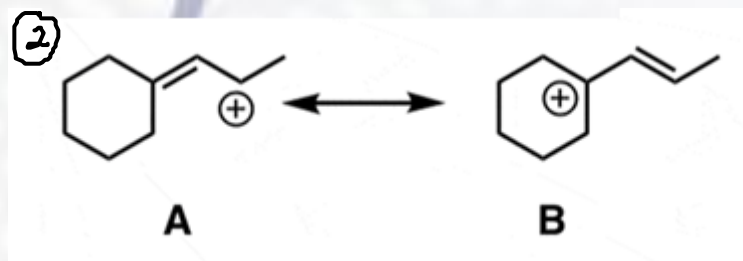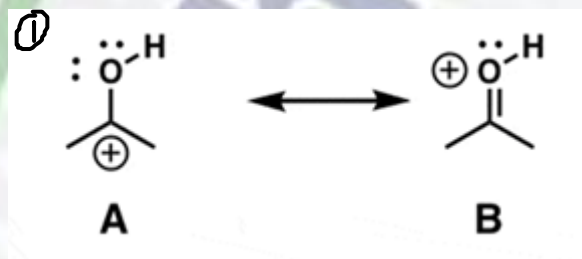
(1) $2CO + O_2 \rightleftharpoons 2CO_2$

(2) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

(3) $N_2 + O_2 \rightleftharpoons 2NO$

(4) $PCl_5 \rightleftharpoons PCl_3 + Cl_2$
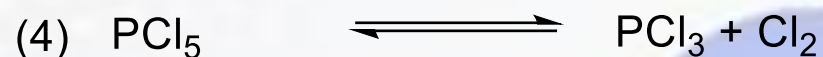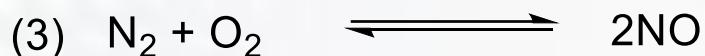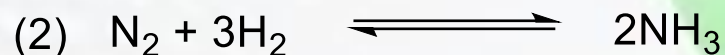
6. If initially the concentration of A and B are both equal but at equilibrium, concentration of D will be twice than that of A then what will be the equilibrium constant of the reaction?

$$A + B \rightleftharpoons C + D$$

(a) $\dfrac{4}{9}$ **(b)** $\dfrac{9}{4}$ **(c)** $\dfrac{1}{9}$ **(d) 4**

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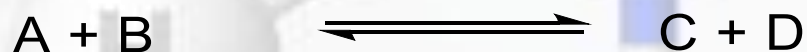
7. Two first order reaction have half lives in the ratio 8:1. calculate the ratio of time intervals t_1: t_2. The time t_1 and t_2 are the time period for $1/4^{th}$ completion of the first reactions and $3/4^{th}$ completion of the second reaction respectively?

(a) 1 : 0.301   (b) 0.125 : 0.502   (c) $1 : 0.08$ (d) None of these

8. For reaction $A \Longrightarrow B$ The rate constant $k_1 = A_1\ e^{-Ea_1/RT}$ and for the reaction $X \Longrightarrow Y$ The rate constant $k_2 = A_2\ e^{-Ea_2/RT}$

If $A_1 = 10^9$, $A_2 = 10^{10}$ and $E_{a1} = 1200$ cal/mol and $E_{a2} = 1800$ cal/mol then the temperature at which $k_1 = k_2$. Given R = 2 cal/K-mol

(1) 300 K, (2) 300 x 2.30 K (3) $\dfrac{300}{2.303}$ K, (4) None of these

9. A graph between log $t_{1/2}$ and log a. a being the initial concentration of A in the reaction for A ⟶ product. The rate law is

log $t_{1/2}$

Slope = -1

log a
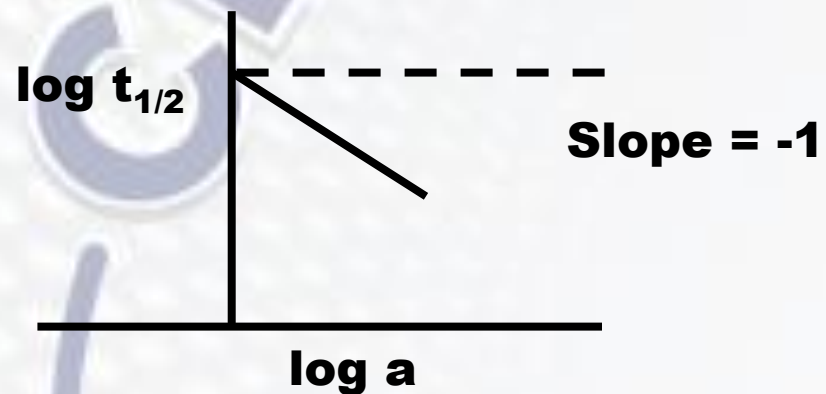
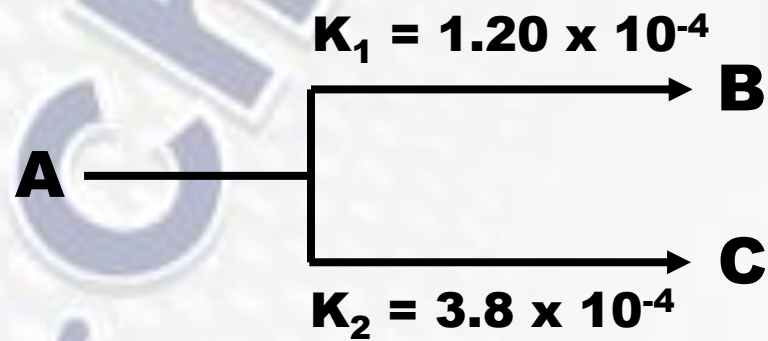(1) $-\dfrac{d[A]}{dt} = K$

(2) $-\dfrac{d[A]}{dt} = K[A]$

(3) $-\dfrac{d[A]}{dt} = K[A]^2$

(4) $-\dfrac{d[A]}{dt} = K[A]^3$

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10. For the following reaction % of B formed is

$K_1 = 1.20 \times 10^{-4}$

A → B

$K_2 = 3.8 \times 10^{-4}$

A → C

(1) 24%, (2) 12%, (3) 36%, (4) 48%

11. 40 mL of 0.1 M ammonia solution is mixed with 20 mL of 0.1 M HCl . What is the pH of the mixture? pK_b of ammonia solution is 4.74.

(1) 4.74, (2) 2.26, (3) 9.26, (4) 5.00

12. Mass of FeC_2O_4 oxidized by 0.6 mole of $KMNO_4$ in acidic medium is?

(1) 1 g, (2) 74 g, (3) 144 g, (4) 134 g

13. Which halogen acid is a liquid?
a) HF b) HCl c) HBr d) HI

14. The characteristic is not related to alkali metal is

(a) high ionization energy, (b) their ions are isoelctronic with noble gases, (c) Low melting point (d) Low electronegativity
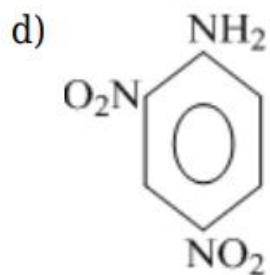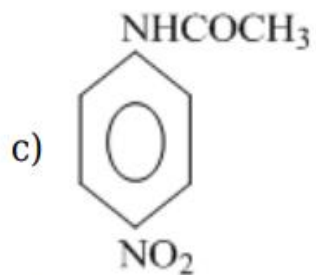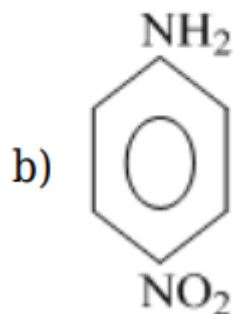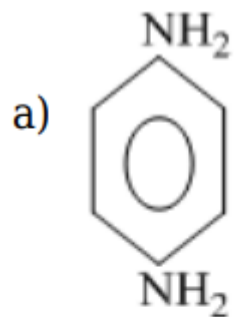
15. When 32.25 g of ethyl chloride is subjected to dehydrohalogenation reaction the yield of the alkene formed is 50%. The mass of the product is (atomic mass of Cl =35.5)

(a) 14 g (b) 28 g, (c) 64.5 g (d) 7 g

16.

Identify X in the series,

$NHCOCH_3$ attached to benzene ring $\xrightarrow[H_2SO_4]{HNO_3}$ Intermediate $\xrightarrow[\Delta]{H_2O}$ X:

a) benzene ring with NH_2 (top) and NH_2 (bottom)

b) benzene ring with NH_2 (top) and NO_2 (bottom)

c) benzene ring with $NHCOCH_3$ (top) and NO_2 (bottom)

d) benzene ring with NH_2 (top), O_2N and NO_2 (bottom)
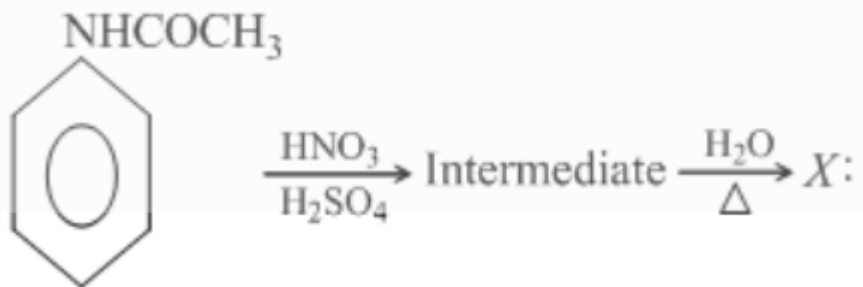
17. If a mixture containing 3 moles of hydrogen and 1 mole of nitrogen is converted completely into ammonia, the ratio of initial and final volumes under the same temperature and pressure would be:

a) 3 : 1 b) 1 : 3 c) 2 : 1 d) 1 : 2

18. A metal having negative reduction potential when dipped in the solution of its own ions, has a tendency :
 a) To pass into the solution
b) To be deposited from the solution
 c) To become electrically positive
d) To remain neutral

19. The empirical formula of a non-electrolyte is CH_2O. A solution containing 6g of the compound exerts the same osmotic pressure as that of 0.05 M glucose solution at the same temperature. The molecular formula of the compound is

a) $C_2H_4O_2$ b) $C_3H_6O_3$ c) $C_5H_{10}O_5$ d) $C_4H_5O_4$

20. From the stability constant (hypothetical values) given below, predict which is the strongest ligand?

a) $Cu^{2+} + 4NH_3 \rightleftharpoons [Cu(NH_3)_4]^{2+}$; $(K = 4.5 \times 10^{11})$

b) $Cu^2 + 4CN \rightleftharpoons [Cu(CN)_4]^{2-}$; $(K = 2.0 \times 10^{27})$

c) $Cu^{2+} + 2en \rightleftharpoons [Cu(en)_2]^{2+}$; $(K = 3.0 \times 10^{15})$

d) $Cu^{2+} + 4H_2O \rightleftharpoons [Cu(H_2O)_4]^{2+}$; $(K = 9.5 \times 10^8)$

21. 2-methylpropene is isomeric with butene-1. They can be distinguished by
a) Baeyer's reagent
b) Ammoniacal AgNO$_3$
c) Br$_2$, solution
d) O$_3$, Zn/H$_2$O

22. The Kolbe's electrolysis proceeds *via*

a) Nucleophilic substitution mechanism   b) Electrophilic addition mechanism

c) Free radical mechanism   d) Electrophilic substitution reaction

23. In which of the following $p\pi - d\pi$ bonding is observed?

a) NO_3^- b) SO_3^{2-} c) BO_3^{3-} d) CO_3^{2-}

24. Na_2O, MgO, Al_2O_3 and SiO_2 have heat of formation equal to $-416, -602, -1676$ and -911 kJ mol^{-1} respectively. The most stable oxide is

a) Na_2O b) MgO c) Al_2O_3 d) SiO_2

25. Oxidation number of carbon in carbon suboxide is :

a) $+\dfrac{2}{3}$ b) $+\dfrac{4}{3}$ c) $+4$ d) $-\dfrac{4}{3}$

All the Best