CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA TPC JEE MAIN TEST 41

Chemistry

1. According to the VSEPR theory the geometry of ClO_3^- ion should be

A. Planar trianglular
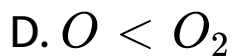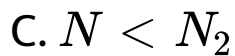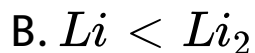
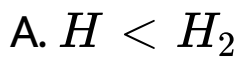B. Trigonal pyramidal

C. Tetrahedral

D. Square planar

Answer: B

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2. Which in correct order of ionisation energy is

A. $H < H_2$

B. $Li < Li_2$

C. $N < N_2$

D. $O < O_2$

Answer: D

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3. Correct formula of Azurite is

A. $CuCO_3 . Cu(OH)_2$

B. $2CuCO_3 . Cu(OH)_2$

C. $CuCO_3 . 2Cu(OH)_2$

D. $CuSO_4 . Cu(OH)_2$
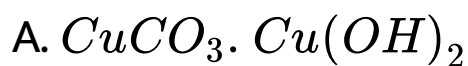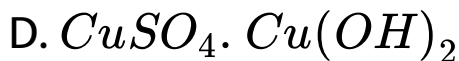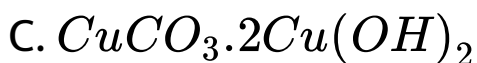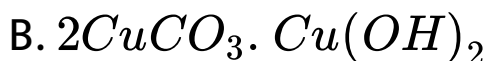
Answer: B

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4. A two litre aqueous solution of hydrogen peroxide gives 20 litres of oxygen gas at NTP. The volume strength of this solution is

A. 10 volume

B. 20 volume

C. 2 volume

D. 40 volume

Answer: A

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5. Which of the following statements is not correct?

A. All the bond lengths in dichromate ion are not equal.

B. All the bond angles in dichromate ion are of $109°\,28'$

C. $E°_{red}\,MnO_4^-$ (acidic) $> E°_{red}\,MnO_4^-$ (neutral) $> E°_{red}\,MnO_4^-$ (alkaline)

D. Both b and c

Answer: D

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6. Which of the following pair of species doesn't gives same gaseous product on hydrolysis?

A. LiH & CaH_2

B. Li_3N & $CaNH$

C. $NaNH_2$ & Mg_3N_2

D. $NaNO_3$ & $NaNH_2$
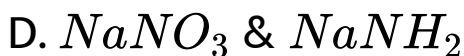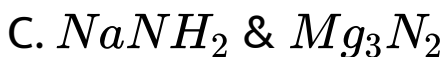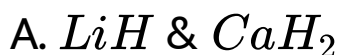
Answer: D

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7. In the following sequence of reactions the final product Y is

$$(CH_3)_2CHOH \xrightarrow{PBr_3} \xrightarrow{KOH\,(aq)} Y$$
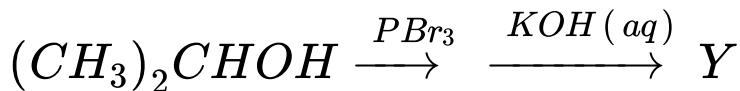
A. Propene

B. Propan-1-ol

C. Propan-2-ol

D. Propane

Answer: C

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8.

Identify A and B.

A.

B.

C.

D.

Answer: B

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9. Ring chain isomerism is shown by which of the following pair?

A.

B.

C.

D.

Answer: C

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10. The dependence of the rate constant for a reaction on temperature is given by the equation $k = Ae^{-\frac{E_a}{R}T}$ Under what conditions is the rate constant k the smallest?

    A. Hith T and large E_a

    B. High T and small E_a

    C. Low T and large E_a

    D. Low T and small E_a

Answer: C

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11. Select the correct graph electrode potential

for Fe is given by the relation

$$E_{Fe^{2\oplus}/Fe} = E_{Fe^{2\oplus}/Fe^{\circ}} = -\frac{0.0591}{2}$$

$$\times \frac{\log 1}{[Fe^{2\oplus}]}$$

A.

B.

C.

D.

Answer: C

12. For a weak acid HA the value of $K_a = 10^{-4}$, then calculate the pH of 0.01M solution of this acid.

   A. 0.1

   B. 3

   C. 0.7

   D. 1

Answer: B

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13. A 0.120 molal solution of CsCl[with ionizes in the solution as $CsCl \Leftrightarrow Cs^+ + Cl^-$] freezes at $-0.4°C$. The Van't Hoff factor and degree of dissociation of CsCl in the solution, respectively are (Given K_f (wate) = $1.86 K kg \text{mol}^{-1}$)

A. 1.79, 0.79

B. 1.5, 0.5

C. 1.92, 0.92

D. 1.2, 0.2

Answer: A

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14. A metal sulphate is isomorphous with $ZnSo_4.7H_2O$. The % of metal content is 9.87% in this metal sulphate, find the weight of the metal in this sulphate.

A. 40.3

B. 36.3

C. 24.3

D. 11.3

Answer: C

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15. A balloon is filled with 2L air in Kota where temperature is $27°C$. What will be the volume of the balloon when it si carried to Shimla

where temperature is $0°C$? (Assume atmospheric pressure is same)

A. 0L

B. $2L$

C. $0.55L$

D. 1.82

Answer: D

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16. The correct vaues of the four quantum numbers of the valency electron of potasium are:

A. n 1 m s

    4 0 0 $1/2$

B. n 1 m s

    4 1 0 $1/2$

C. n 1 m s

    4 0 1 $1/2$

D. n	1	m	s
4	1	1	$1/2$

Answer: A

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17. Which of the following substances gives a positively charged sol?

A. Gold

B. A metal sulphite

C. Ferric hydroxide

D. An acidic dye in basic medium

Answer: C

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18. Calculate the entropy change for vaporization of water. Given enthalpy change for liquid water to steam at $100°C$ is $40.8kJmol^{-1}$

A. $203 JK^{-1}mol^{-1}$

B. $\dfrac{109}{38}JK^{-1}mol^{-}$

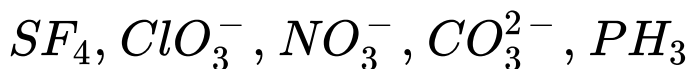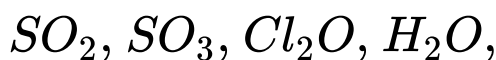C. $131.25 JK^{-1}mol^{-1}$

D. $24 JK^{-1}mol^{-1}$

Answer: B

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19. The CFSE of $[CoCl_6]^{4-}$ compled is $18000cm^{-1}$. The Δ for $[CoCl_4]^{2-}$ will be

20. How many of the following species contain

sp^3 hybridized central atom?

SO_2, SO_3, Cl_2O, H_2O,

SF_4, ClO_3^-, NO_3^-, CO_3^{2-}, PH_3

XeF_4, XeO_3, XeO_4

and NH_4^+

21. Following is the first list of oxyacids of halogens, thecount of compounds in which oxidation number of halogen is not greater than $+4$ is/are

(i) Hypochlorous acid

(ii) Chlorous acid

(iii) Bromic acid

(iv) Periodic acid

(v) Hypiodous acid

(vi) Perchloric acid

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22. The entropy change involved in the isothermal reversible expansion of 1 mole of an ideal gas form a volume of 20L to 200L at 300 K is ....JK^{-1}
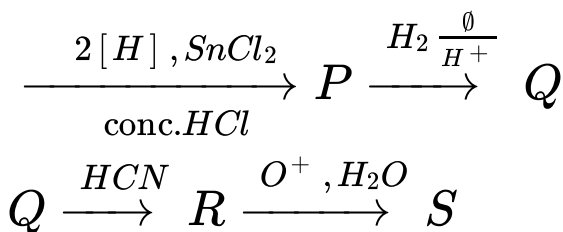
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23. How many alcohol groups are present in fructofuranose structure?

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24. Methyl cyanide

$$\xrightarrow[\text{conc.}HCl]{2[H]\,,\,SnCl_2} P \xrightarrow[H^+]{H_2\,\frac{\emptyset}{}} Q$$

$$Q \xrightarrow{HCN} R \xrightarrow{O^+\,,\,H_2O} S$$

Find the number of chiral carbon(s) present in the final product S.

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25. 3-Chloro-3-cyclopentylhexane

$$\xrightarrow[\Delta]{AlcKOH}$$ The number of possible products(s) in the above reaction is ....

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26. Some alkenes are given

How many alkenes are more reactive than $CH_2 = CH_2$ towards reaction with HBr?
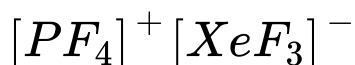
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27. Consider the following statements with given codes. The sum of codes with correct statements is =X

(1) XeF_4 undergoes disproportionation on hydrolysis

(2) XeF_4 produces O_2 on hydrolysis.
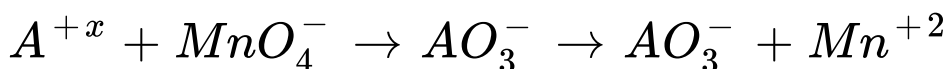
(3) On reaction with PF_3, XeF_2 gives $[PF_4]^+[XeF_3]^-$

(4) XeF_6 can be prepared by reaction of XeF_4 with O_2F_2

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28.

$$A^{+x} + MnO_4^- \rightarrow AO_3^- \rightarrow AO_3^- + Mn^{+2}$$

if 1 mol MnO_4^- oxidizes 1.67 mol mol of A^{+x}

to AO_3^-, then the value of x in the reaction is