CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA TPC JEE MAIN TEST 52

Chemistry

1. Among the following molecular orbitals, which molecular orbital has two mutually perpendicular nodal planes?

A. σ_{1s}

B. σ_{2p}^*

C. π_{2p}

D. π_{2p}^*

Answer: D

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2. The correct order of 2nd ionisation potential of carbon, nitrogen, oxygen and fluorine is

A. $C > N > OF$

B. $O > N > F > C$

C. $O > F > N > C$

D. $F > O > N > C$

Answer: C

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3. During which of the following extraction of metal poling process is used:

A. Zn

B. Cu

C. Mg

D. Both (B) and (C)

Answer: D

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4. $3LH_2O_2$ (aq) solution upon decomposition produces $33.6LO_2(g)$ at 1 atm and $0°C.$ Then concentration of $H_2O_2(aq)$ solution in mol/L is

A. 1

B. 1.5

C. 2

D. 0.5

Answer: A

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5. CrO_4^{2-} (yellow) changes to $Cr_2O_7^{2-}$ (orange) on $pH = x$ & vice-versa in pH = y.
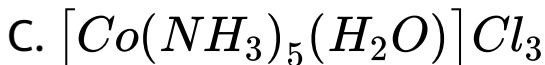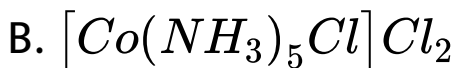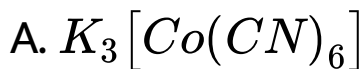
Hence, x & y are :-

A. 6, 8

B. 6, 5

C. 8, 6

D. 7, 7

Answer: A

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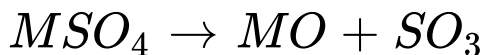**6.** Among the following complexes, the complex which has highest crystal field splitting energy

A. $K_3\left[Co(CN)_6\right]$

B. $\left[Co(NH_3)_5Cl\right]Cl_2$

C. $\left[Co(NH_3)_5(H_2O)\right]Cl_3$

D. $K_2\left[CoCl_4\right]$

Answer: A

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7. Which of the following sulphates is most stable for following change ?

$$MSO_4 \rightarrow MO + SO_3$$

A. $BeSO$

B. $MgSO_4$

C. $CaSO_4$

D. $BaSO_4$

Answer: D

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8. Cyclohexanol $\xrightarrow{PCC} A.$ The product $\xrightarrow[\text{B will be}]{\text{HCHO,dil}KOH\,/\,\Delta} B$ B will be
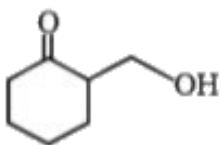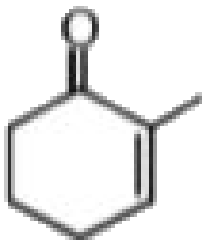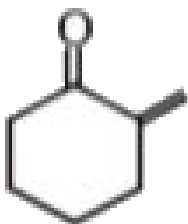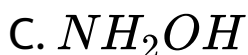
A.
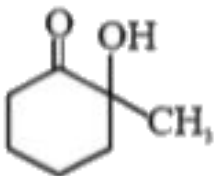
B.

C.

D.

Answer: D

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9. Reaction between a given reagent and HCHO is a disproportionation reaction. The reagent is:

A. PCl_5

B. $NaOH$

C. NH_2OH

D. HCN

Answer: B

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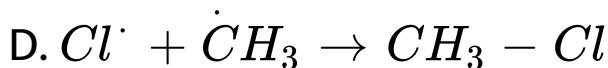
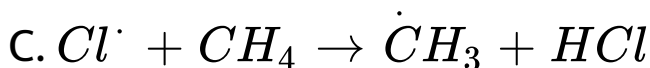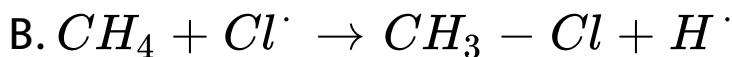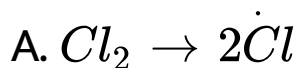**10.** Which pair of compounds give Tollen's test?

    A. Glucose and fructose

    B. Sucrose and glucose

    C. Hexanal and acetophenone

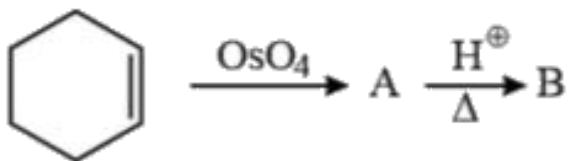   D. Fructose and sucrose

Answer: A

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11. Which of the following cannot be considered as a step of mechanism in the chain reaction of methane with Cl_2?

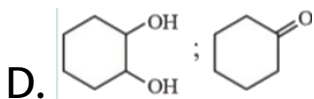A. $Cl_2 \rightarrow 2\dot{C}l$

B. $CH_4 + Cl^{\cdot} \rightarrow CH_3 - Cl + H^{\cdot}$

C. $Cl^{\cdot} + CH_4 \rightarrow \dot{C}H_3 + HCl$

D. $Cl^{\cdot} + \dot{C}H_3 \rightarrow CH_3 - Cl$

Answer: A

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$$\text{(cyclohexene)} \xrightarrow{\text{OsO}_4} A \xrightarrow[\Delta]{H^{\oplus}} B$$

12.

A & B are respectively

A.

B.

C.

D.
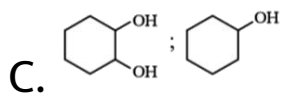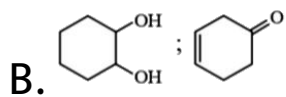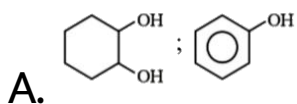
Answer: D

13. Calculate the number of stereocenter and stereosiomers of the compound given below.
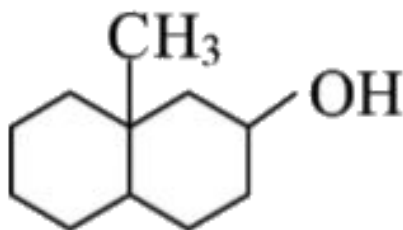

A. 1 and 2

B. 2 and 4

C. 2 and 8

D. 3 and 6

Answer: C

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14. Which does not react with tollen's reagent?

A. -CHO

B. $CH_3 - C \equiv CH$

C. $H - \overset{\overset{\displaystyle O}{||}}{C} - OH$

D. $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$
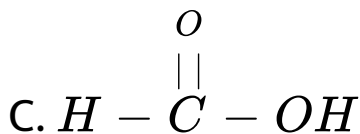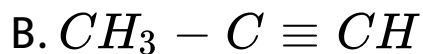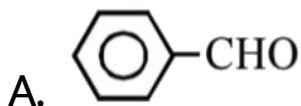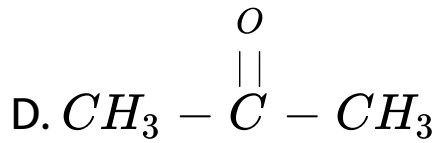
Answer: D

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15. The medicine that is ingested to reduce the

fever is known as:

    A. Pyretics

    B. Antipyretics

    C. Antibiotics

D. Antiseptics

Answer: B

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16. Which of the following is an incorrect statement:

A. Mercury cell is a primary cell providing a constant potential.

B. During recharging lead storage cell works as electrolytic cell.

C. Galvanised iron does not rust.

D. In electrolytic cell reduction occurs at anode and in galvanic cell oxidation takes place at anode

Answer: D

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17. $KMnO_4$ oxidised C_2H_5OH to CO_2 and is itself reduced to Mn^{2+} in an acidic medium.

$$12MnO_4^- + 5C_2H_5OH + 36H^+$$

$$\rightarrow 12Mn^{2+} + 10CO_2 + 33H_2O$$
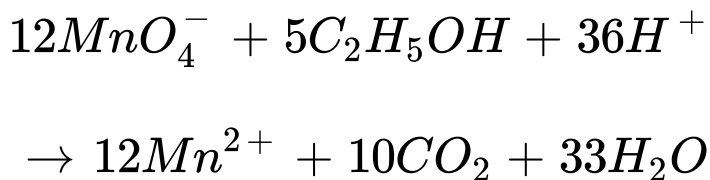
Equvalents of C_2H_5 OH oxidised per mole of $KMnO_4$ is :

A. 5

B. $\dfrac{5}{12}$

C. $\dfrac{4}{5}$

D. $\dfrac{1}{5}$

Answer: A

18. A crystal formula AB3 has Aions at the cube corners and B ions at the edge centres. The coordination number of A and B, respectively, are:

A. 6 and 6

B. 2 and 6

C. 6 and 2

D. 8 and 8

Answer: C

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19. In a reaction, which of the following changes in the presence of a catalyst?

A. Velocity constant

B. Threshold energy

C. Mechanism of the reaction

D. All of these

Answer: D

20. Which of the following is true for an isothermal free expansion of an ideal gas?

A. $q = 0$

B. $w = 0$

C. $\Delta H = 0$

D. All of these

Answer: D

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21. In extraction process of silver, it is passed into the solution with formation of complex with cyanide anion. The coordination number of silver ion in the complex is --------
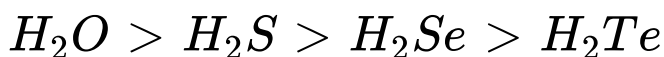
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22. Find the number of molecules / ions which are having unpaired electron in its antibonding molecular orbital.
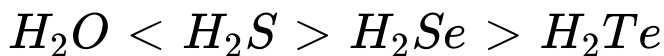
$$O_2, N_2, NO, N_2^+, O_2^+, O_2^-, O_2^{2+}$$
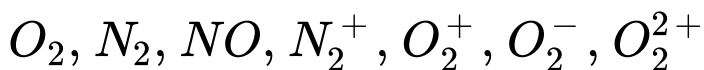
23. The number of trends, which are true with respect to the properties of hydrides of oxygen family:

1) Bond angle:

$$H_2O > H_2S > H_2Se > H_2Te$$
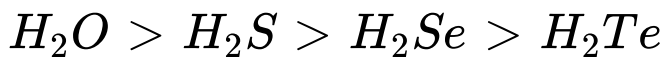
2) Volatility :

$H_2O < H_2S > H_2Se > H_2Te$

3) Thermal stability:

$H_2O > H_2S > H_2Se > H_2Te$

4) Acidic strength :
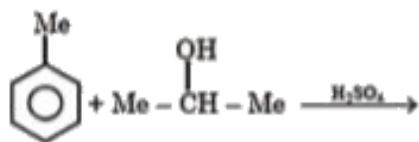
$H_2O > H_2S > H_2Se > H_2Te$
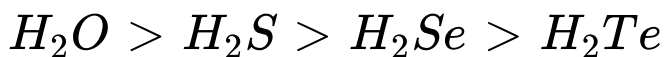
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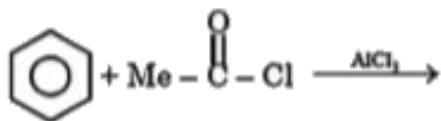**24.** How many reaction are named as Friedel Craft's reaction:

(A)

Me

$\underset{\overset{\displaystyle OH}{|}}{+ \ Me - CH - Me} \xrightarrow{H_2SO_4}$

(B)

$+ \ Me - \overset{\overset{\displaystyle O}{\|}}{C} - Cl \xrightarrow{AlCl_3}$

(C)

$\xrightarrow{AlCl_3}$

(D)

$O - \overset{\overset{\displaystyle O}{\|}}{C} - Me$

$\xrightarrow[\Delta]{AlCl_3}$

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25. $RCH_2OH + CrO_3 \xrightarrow{aq.H_2SO_4} Z + Cr^{X+}$
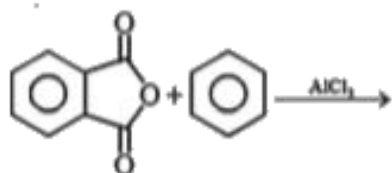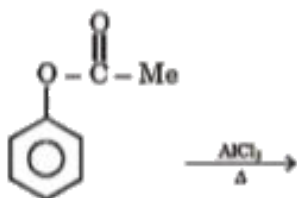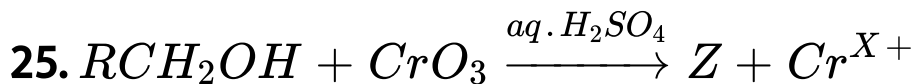
The oxidation number 'x' of Cr will be

26. The equilibrium

$N_2(g) + O_2(g) \Leftrightarrow 2NO(g)$ has
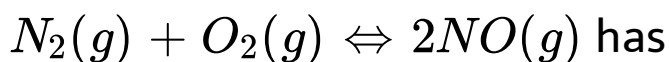
been established in a reaction vessel of 2.5 L.

The amount of N_2 and O_2 taken initially were

2 moles and 4 moles respectively. 0.5 mol of

nitrogen has been used up at equilibrium.

What is the molar concentration of nitric oxide ? (give your answer by multiplying it with 100)

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27. Calculate Henry's law constant for H_2S. whose solubility in water at STP is assumed to be 0.195 m.

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28. A 2.0 g sample of a mixture containing Na_2CO_3, $NaHCO_3$ and is gently Na_2SO_4 heated till the evolution of CO_2 stops. The evolved CO_2 has volume of 123.9 mL measured at 50 mm Hg pressure and 298 K.

1.5 g of the same sample is completely neutralised by 150 mL of 0.1M HCl. The percentage composition of Na_2SO_4 in the original mixture is:

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29. Pressure of 1 g of an ideal gas A at $27°C$ is found to be 2 bar. When 2 g of another ideal gas B is introduced in the same flask at same temperature, the pressure becomes 3 bar. How much times molar mass of B is that of molar mass of A

30. Elctrons make transition from n =2 to n =1 in a sample of excited hydrogen atom. Emitted photons strike on a metal of work function

$(\phi) = 4.2eV.$ What is the valueof maximum kinetic energy of ejected electron in process ?