CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA TPC JEE MAIN TEST 53

Chemistry

1. In solid-state $PC1_5$ exists in ionic form. Mark the correct hybridization state of Phosphorus in cationic and anionic form respectively.

A. dsp^2, sp^3d^2

B. sp^3, sp^3d^2
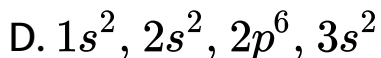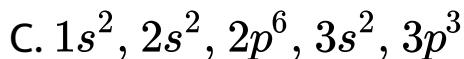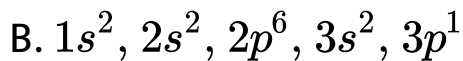
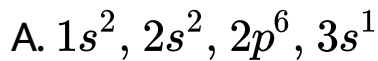C. sp^3d^2, sp^3

D. sp^3d^2, dsp^2

Answer: B

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2. The value of IP_1, IP_3 and IP_4 of an atom are, respectively,

7.5 eV, 25.6 eV, 48.6 eV and 170.6 eV. The electronic

configuration of the atom will be:

A. $1s^2, 2s^2, 2p^6, 3s^1$

B. $1s^2, 2s^2, 2p^6, 3s^2, 3p^1$

C. $1s^2, 2s^2, 2p^6, 3s^2, 3p^3$

D. $1s^2, 2s^2, 2p^6, 3s^2$

Answer: B

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3. In the electrolytic refining of copper, Ag and Au are found :

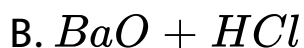A. On cathode

B. On anode
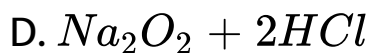
C. In the anodic mud

D. In the cathodic mud

Answer: C

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4. Which of the following reactions releases hydrogen?

A. $H_2S_2O_8 + H_2O$

B. $BaO + HCl$

C. $Ca + H_2O$

D. $Na_2O_2 + 2HCl$
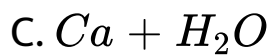
Answer: C

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5. The product of I^- with MnO_4^- in alkaline medium is :

A. I_2

B. IO_3^-

C. IO^-

D. IO_4^-
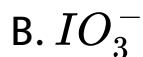
Answer: B

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6. For the square planar complex:

$[MCI(F)(CI)(NO_2)(SCN)]$. Calculate the total number of isomers for the given compound.

A. 12

B. 16

C. 4

D. 8

Answer: A

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7. An element has atomic weight 39. Its electronic

configuration is

$1s^2, 2s^2 2p^6, 3s^2 3p^6 4s^1$. The true statement for

that element is :

A. large (I.E.)

B. transition element
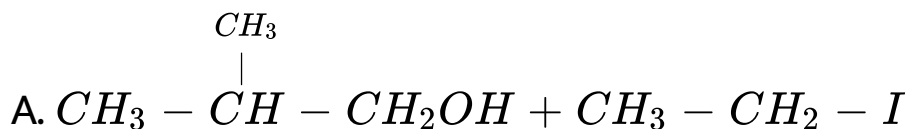
C. isotone with $_{18}Ar^{35}$

D. stable oxide MO_2

Answer: D

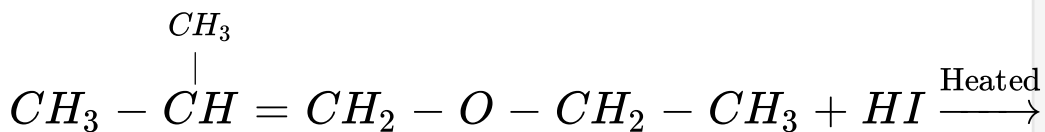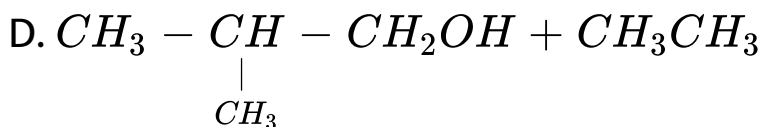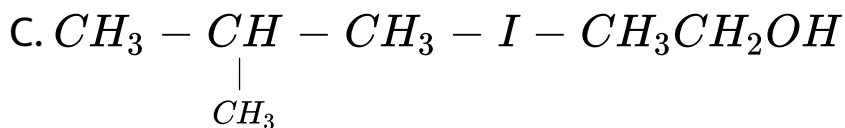**8.** The product obtained in the following reaction is:

$$CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{CH} = CH_2 - O - CH_2 - CH_3 + HI \xrightarrow{\text{Heated}}$$

A. $CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{CH} - CH_2OH + CH_3 - CH_2 - I$

$$\text{B. } CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{CH} - CH_2 - I + CH_3CH_2OH$$

$$\text{C. } CH_3 - \underset{\underset{\displaystyle CH_3}{|}}{CH} - CH_3 - I - CH_3CH_2OH$$

$$\text{D. } CH_3 - \underset{\underset{\displaystyle CH_3}{|}}{CH} - CH_2OH + CH_3CH_3$$
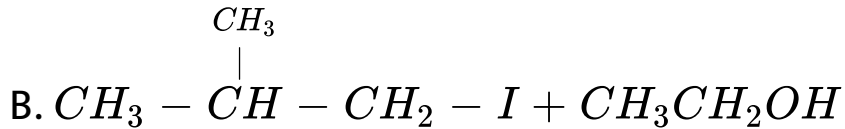
Answer: A

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9. Pair of compounds that can be distinguished by Fehling's test are:

A. CH_3CHO and CH_3COCH_3

B. $CH_3COCH_2CH_3$ and CH_3CH_2CHO
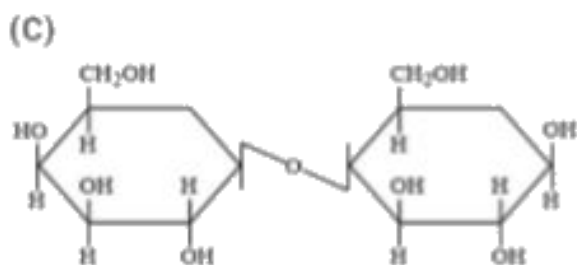
C. C_6H_5CHO and CH_3CH_2CHO

D. All are correct

Answer: D

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10. Which of the following is a reducing sugar:

(A)

(B)

(C)

(D)
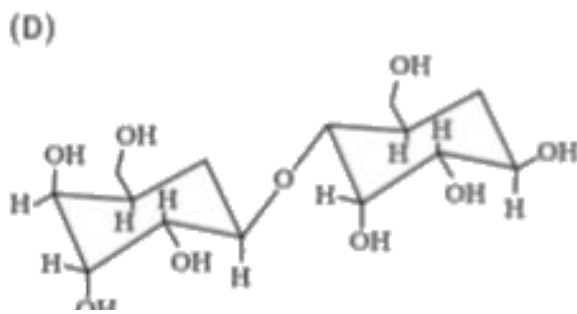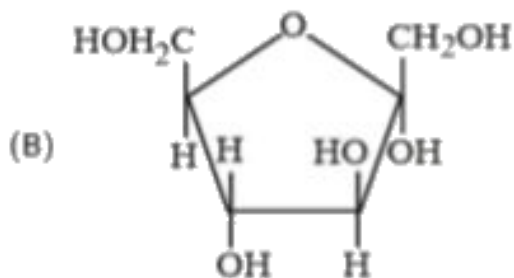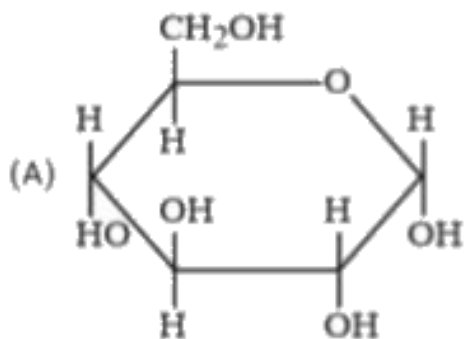
A. A,B,D

B. B,C,D

C. B,C

D. all

Answer: D

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11. $CH_3 - CH_2 - \underset{\underset{F}{|}}{CH} - CH_3 \xrightarrow[\Delta]{alc.KOH}$

Major product is :-

A.

B.

C.

D.
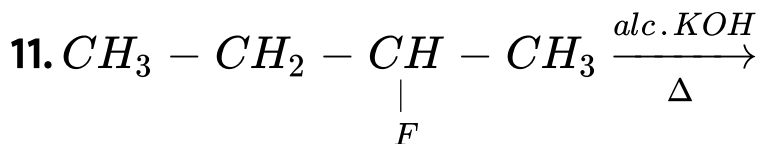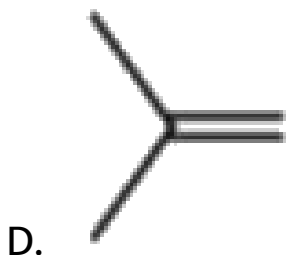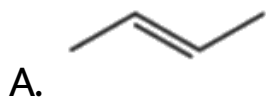
Answer: D

12. Hyperconjugation is best defined by which of the following?

A. A Transfer of H from σ_{C-H} bond to the π system

B. Participation of an H-atom on terminal carbon in the electron sharing

C. Delocalisation of electron density from a properly oriented σ − bond into π − system

D. Interaction between a properly aligned lone electron pair with the empty π -system

Answer: C

13.

$$CH_3 - C \equiv CH \xrightarrow[HgSO_4]{dil.H_2SO_4} A \xrightarrow[H^+/\Delta]{H_2N - \overset{\overset{\displaystyle O}{\|}}{C} - NH - NH_2} B$$
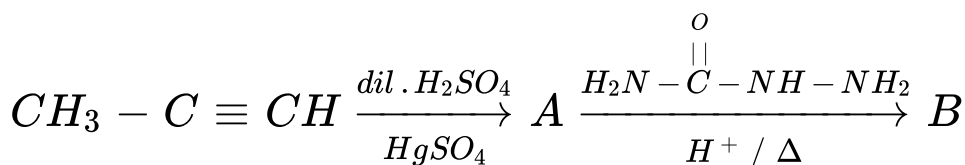
Find B in the given reaction

A. $CH_3 - \underset{\underset{\displaystyle CH_3}{|}}{C} = O$

B. $CH_3 - \underset{\underset{\displaystyle CH_3}{|}}{C} = N - \overset{\overset{\displaystyle O}{\|}}{C} - NH - NH_2$

C. $CH_3 - \underset{\underset{\displaystyle CH_3}{|}}{C} = N - NH - \overset{\overset{\displaystyle O}{\|}}{C} - NH_2$

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = NH$
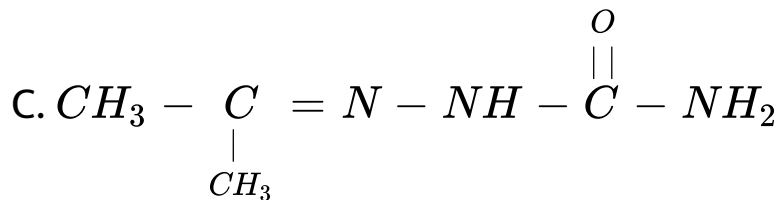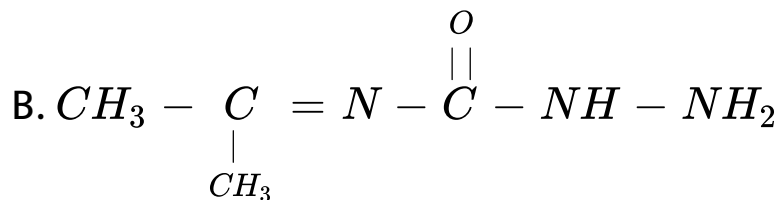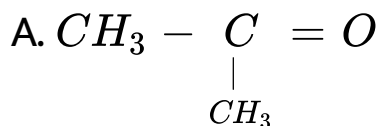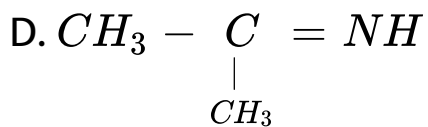
Answer: C

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14. Which compound can be used to prepare Red ink

A. Phenol

B. Aniline

C. Congo red

D. Eosin

Answer: D

15. The specific conductance of a saturated AgCl solution is found to be $1.86 \times 10^{-6} Scm^{-1}$ and that for water is $6.0 \times 10^{-8} Scm^{-1}$. The molar conductance of AgCl at infinite dilution is $180 Scm^2 mol^{-1}$. The solubility of AgCl is:

A. $2 \times 10^{-7} mol L^{-1}$

B. $2 \times 10^{-7} mol L^{-1}$

C. $\times 10^{-7} mol L^{-1}$

D. $2 \times 10^{-14} mol L^{-1}$

Answer: B

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16. If the radius of an octahedral void and that of atom in close packing is r&R respectively then relation between 1 & Ris :

A. $r = 0.155R$

B. $r = 0.225R$

C. $r = 0.414R$

D. $r = 0.732R$

Answer: C

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17. The activation energy of a reaction can be determined from the slope of which of the following graphs ?

A. ln k vs. $\dfrac{1}{T}$

B. $\dfrac{T}{\ln k}$ vs. $\dfrac{1}{T}$

C. $\ln k$ vs. T

D. $\dfrac{\ln k}{T}$ vs. T

Answer: A

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18. one mole of an ideal gas at 300 K is expanded isothermally from an initial volume of 1 litre to 10 litre. The ΔU for this process is:

$$\left(R = 2calK^{-1}mol^{-1}\right)$$

A. 163.7 cal

B. 1381.1 cal

C. 9 litre - atm

D. zero

Answer: D

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19. In the complex $\left[M(en)_2(C_2O_4)\right]Cl$, find the sum of co-ordination number and oxidation number of the metal M.

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20. Number of molecules in which lone pair or odd electron of central atom present in directional orbital
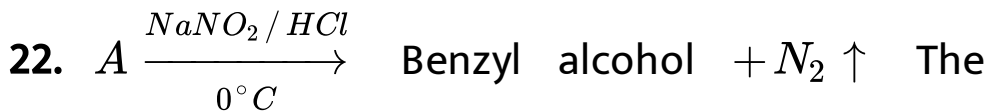
$$NH_3, PH_3, NO_2, ClO_3, H_2O, \dot{C}F_3, \dot{C}H_3$$

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21. In peroxynitric acid, the oxidation number of N is:

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22. $A \xrightarrow[0°C]{NaNO_2/HCl}$ Benzyl alcohol $+N_2 \uparrow$ The
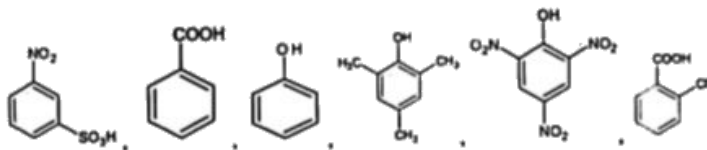
molecular formula of A is C_xH_yN. The value of y is

_____.

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23. Among the following compounds, the total

number of compounds which liberate CO_2 when

reacted with $NaHCO_3$ is:

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24. A 40 ml solution of weak base BOH is titrated with 0.1 N HCl solution. The pH of solution is 10.04 and 9.14 after addition of 5 ml & 20 ml of acid. If K_b for weak base is $Px10^{-5}M$, find P.

25. An aqueous solution of 2% non-volatile solute exerts a pressure of 1.004 bar at $100°C$. What is the molar mass of the solute?

26. Calculate the molar ratio of two acids in the original mixture.If mixture of HCOOH and $H_2C_2O_4$ is heated with concentrated H_2SO_4. The gas produced is collected and on treating with KOH solution, the volume of the gas decreases by 1/6 th. If the ratio comes out to be a:b, report your answer as 'a+b'.

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27. At 101.325 kPa and 300 K, what fraction of N_2 molecules will have speeds in the range of $(u_{mp} - 0.005u_{mp})$ to $(u_{mp} + 0.005u_{mp})$?

28. Velocity of an $\alpha-$ particle is $\dfrac{1}{30}th$ times of velocity of light. The minimum uncertainty in kinetic energy is $y \times 10^{-16} J$ if uncertainty in position is $\dfrac{3.31}{\pi}$ pm. Find out the value of y.