CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 49

Chemistry

1. 25mL of $2NHCl$, $50mLof4NHNO_3$ and $xmLH_2SO_4$ are mixed together and the total volume is made up to 1L after dilution. 50mL if this acid ixture completely reacteed with 25mL of a $1NNa_2CO_3$ solution. The value of x is:

A. 250 ml

B. 62.5 ml

C. 100 ml

D. 125 ml

Answer: B

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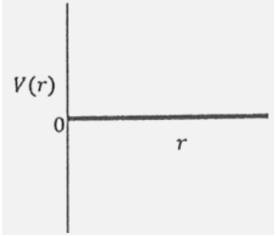
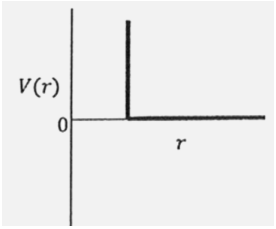
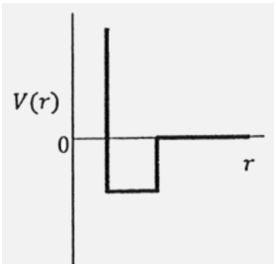
2. One mole of a monoatomic real gas satisfies the equation $p(V-b)=RT$ where b is a constant. The relationship of interatomic potential $V(r)$ and interatomic distance r for gas is given by

A. 

B. 

C. 

D. 

Answer: C

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3. Calculate the heat of formation of benzene from the following data, assuming no resonance. Bond energies :

$C - C = 83kcal, C = C = 140Kcal, C - H = 99kcal$

Heat of atomisation of $C - 1709kcal$

Heat of atomisation of $H = 6 \times 52.1kcal$

A. -65 Kcal

B. -70 Kcal

C. -75 Kcal

D. -80 Kcal

Answer: C

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4. Which of the following orbitals are degenerate?

$3d_{xy}, 4d_{xy}, 3d_z^2, 3d_{yz}, 5d_z^2$

A. $3d_{xy}, 3d_z^2, 3d_{yz}$

B. $4d_{xy}, 3d_z^2, 3d_{yz}$

C. $3d_z^2, 3d_{yz}, 5d_z^2$

D. None

Answer: A

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5. The order of basicity among the following compounds is

A. II gt I gt IV gt III

B. I gt IV gt III gt II

C. IV gt II gt III gt I

D. IV gt I gt II gt III

Answer: D

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6. An acid-base indicator has a K_a of 3.0×10^{-5}. The acid form of the indicator is red and the basic form is blue. (a) By how much must the pH change in order to change the indicator from $75\ \%$ red to $75\ \%$ blue?

A. 0.95

B. 2.3

C. 0.75

D. 5

Answer: A

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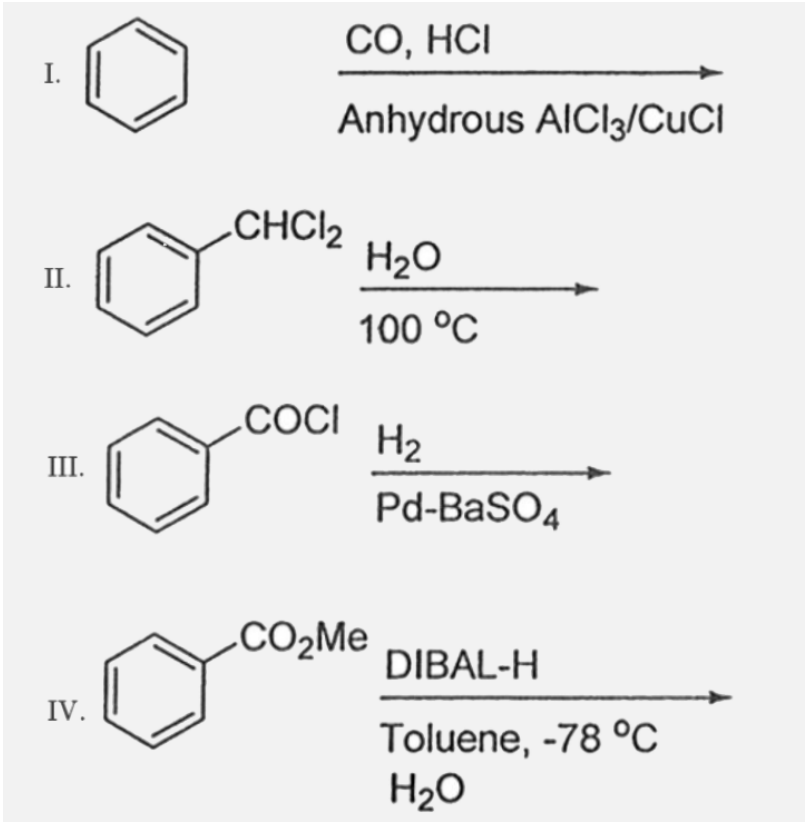
7. Among the following, the number of reaction(s) that produce(s) benzaldehyde is



A. I, II

B. I, III

C. I, III, IV

D. I, II, III and IV

Answer: D

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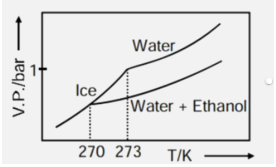
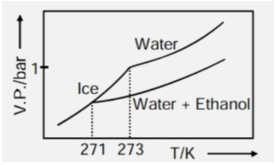
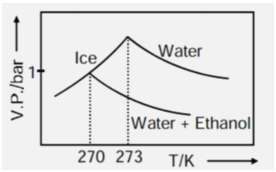
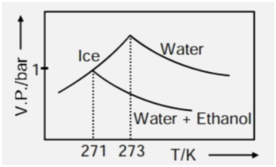
8. Pure water freezes at 273 K and 1 bar. The addition of 34.5 g of ethanol to 500 g of water changes the freezing point of the solution. Use the freezing point depression constant of water as 2 K $kgmol^{-1}$. The figures shown below represent plots of vapour pressure (V.P.) versus temperature (T). [molecular weight of ethanol is$46gmol^{-1}$ Among the following, the option representing change in the freezing point is

A. 

B. 

C. 

D. 

Answer: A

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9. Which of the following atoms has the highest first ionisation energy ?

A. Sc

B. Rb

C. Na

D. K

Answer: A

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10. For the following cell,

$Zn(s)|ZnSO_4(aq)||CuSO_4(aq)|\ |\ Cu(s)$

When the concentration of Zn^{2+} is 10 times the concentration of Cu^{2+}, the expression for ΔG

(in J mol^{-1})

[F is Faraday constant, R is gas constant] T is temperaure, $E^{\circ}(\text{cell}) = 1.1V$

A. $2.303RT + 1.1F$

B. $1.1F$

C. $2.303RT - 2.2F$

D. $-2.2F$

Answer: C

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11. Which of the following products can be formed when 2 - chloro -2- methylpentane reacts with sodium methoxide in methanol?

1. $C_2H_5CH_2\underset{\underset{CH_3}{|}}{\overset{\overset{CH_2}{|}}{C}} - OCH_3$

2. $C_2H_5CH_2\underset{\underset{CH_3}{|}}{C} = CH_2$

3. $C_2H_5CH = \underset{\underset{CH_3}{|}}{C} - CH_3$

A. 3 only

B. 1 and 2

C. 1 and 2

D. 1, 2 and 3

Answer: D

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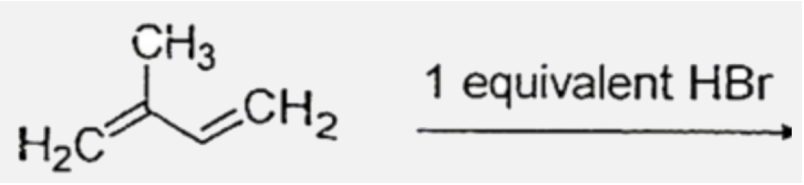
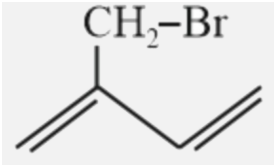
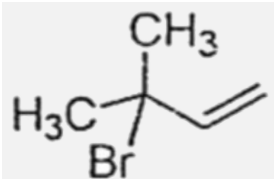
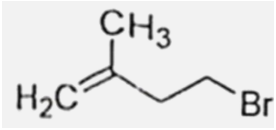
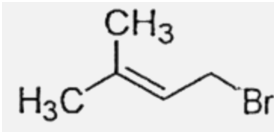
12. In the following reaction, the major product is



A. 

B. 

C. 

D. 

Answer: D

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13. Which of the following gives ketone on oxidation?

A. $(CH_3)_3COH$

B. $CH_3CH_2CH_2OH$

C. $(CH_3)_2CHCH_2OH$

D. $CH_2CHOHCH_3$

Answer: D

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14. Among $[Ni(CO)_4], [NiCl_4]^{2-}, [Co(NH_3)_4Cl_2]Cl, Na_3[CoF_6], Na_2O_2$ and CsO_2, the total number of paramagnetic compounds is

A. 2

B. 3

C. 4

D. 5

Answer: B

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15. Which of the following combination will produce H_2 gas ?

A. Fe metal and conc. HNO_3

B. Cu metal and conc. HNO_3

C. Au metal and $NaCN(aq)$ in the presence of air

D. Zn metal and $NaOH(aq)$

Answer: D

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16. Given that for a reaction of nth order, the integrated rate equation is:

$K = \frac{1}{t(n-1)}\left[\frac{1}{C^{n-1}} - \frac{1}{C_0^{n-1}}\right]$, where C and C_0 are the concentration of reactant at time t and initially respectively. The $t_{3/4}$ and $t_{1/2}$ are related as $t_{3/4}$ is time required for C to become $C_{1/4}$) :

A. $t_{\frac{3}{4}} = t_{\frac{1}{2}}\left[2^{n-1}+1\right]$

B. $t_{\frac{3}{4}} = t_{\frac{1}{2}}\left[2^{n-1}-1\right]$

C. $t_{\frac{3}{4}} = t_{\frac{1}{2}\left[2^{n+1}-1\right]}$

D. $t_{\frac{3}{4}} = t_{\frac{1}{2}}\left[2^{n+1}+1\right]$

Answer: A

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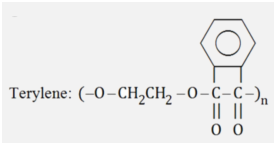
17. Which of the following is not correctly matched?

A. Neoprene:

$$-\left(CH_2-\underset{\underset{|}{Cl}}{C}=CH-CH_2-\right)_n$$

B. Nylon - 66:

$$-\left(NH-(CH_2)_6-NH-Co-(CH_2)_4-\overset{\overset{||}{O}}{C}\right)_n$$

C. 

D. Polymethyl methacrylate (PMMA):

$$\left(-CH_2 - \underset{\displaystyle COOCH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - \right)_n$$

Answer: C

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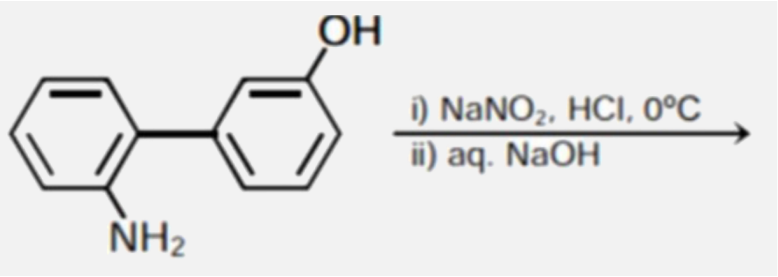
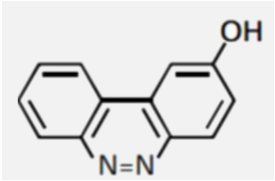
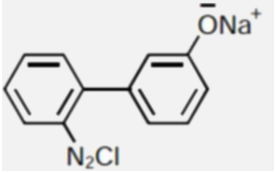
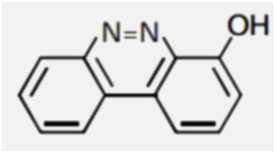
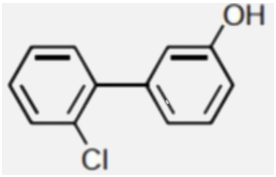
18. The major product of the following reaction is



A. 

B. 

C. 

D. 

Answer: A

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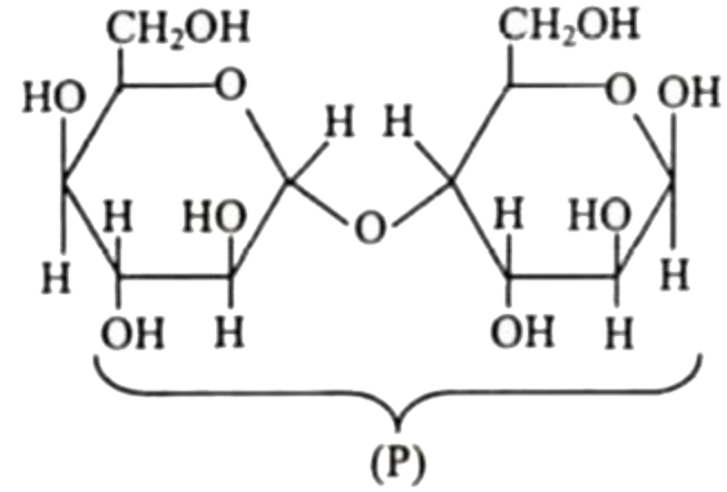
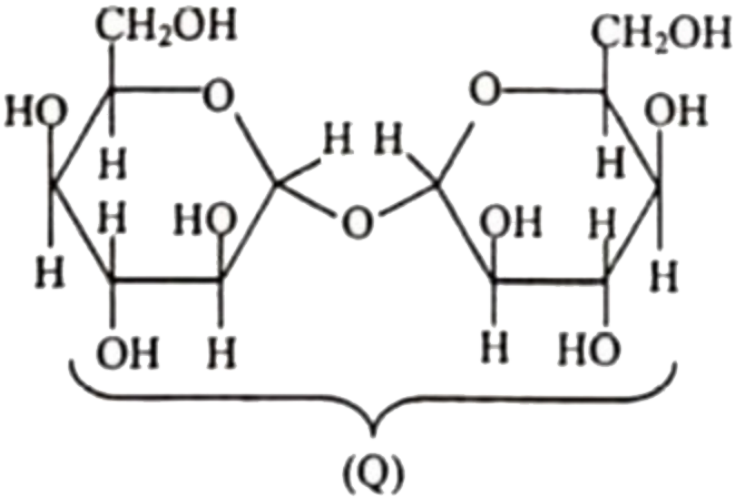
19. Which of the following disaccharide will not reduce Tollen's reagent?



(P)



(Q)

A. P

B. Q

C. P and Q both

D. None of these

Answer: B

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20. The concentration of fluoride, lead, nitrate and iron in a water sample from an underground lake was found to be 1000 ppb,40 ppb,100 ppm and 0.2 ppm, respectively. This water is unsuitable for drinking due to high concentration of

A. Iron

B. Fluoride

C. Lead

D. Nitrate

Answer: D

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21. The sum of the number of lone pairs of electrons on each central atom in the following species is

$[TeBr_6]^{2-}$, $[BrF_2]^{+}$ and $[XeF_3]^{-}$

(Atomic number : F = 9, Br = 35, Te = 52, Xe = 54)

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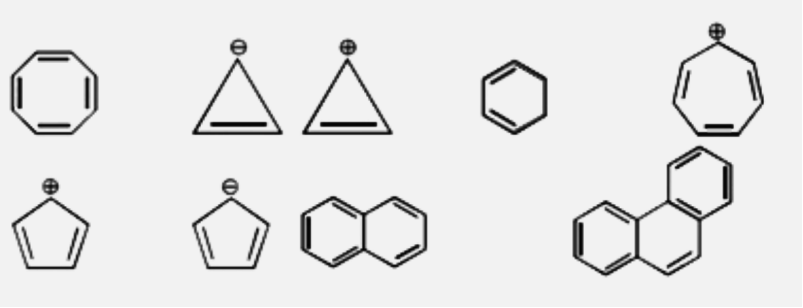
22. Among the following, the number of aromatic compound(s) is



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23. Three moles of B_2H_6 are completely reacted with methanol. The number of moles of boron containing product formed is:

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24. A crystalline solid of a pure substance has a face-centred cubic structure with a cell edge of 400 pm. If the density of the substance in the crystal is $8gcm^{-3}$, then the number of

atoms present in 256g of the crystal is $N \times 10^{24}$. The value of N is

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25. Equilibrium constant for reaction $NH_4OH(aq) + H^+(aq) \Leftrightarrow NH_4^+(aq) + H_2O(l)$ 1.8×19^9.

Hence equilibrium constant for ionization $NH_3 + H_2O \Leftrightarrow NH_4^+(aq) + OH^-(aq)$ is $x \times 10^{-6}$. The value of 'x' is

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