CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 63

Chemistry

1. The solubility of alkli metals salts in water is due to the fact that the cations get hydrated by water molecules. The degree of hydration depends upon the size of the cation. If the trend of relative ionic radii is $Cs^+ > Rb^+ > K^+ > Na^+ > Li^+$.

What is the relative degree of hydration?

A. $Ca^+_{(aq)} > Rb^+_{(aq)} > K^+_{(aq)} > Na^+_{(aq)} > Li^+_{(aq)}$

B. $Li^+_{(aq)} > Na^+_{(aq)} > K^+_{(aq)} > Rb^+_{(aq)} > Cs^+_{(aq)}$

C. $Na^+_{(aq)} > K^+_{(aq)} > Rb^+_{(aq)} > Cs^+_{(aq)} > Li^+_{(aq)}$

D. $Cs^+_{(aq)} > Na^+_{(aq)} > Li^+_{(aq)} > K^+_{(aq)} > Rb^+_{(aq)}$

Answer: B

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2. Fill in the blanks :

(i) $Ca_3P_2 + 6HCl \rightarrow 3CaCl_2 + ... p....$

(ii) $P_4 + 3NaOH + 3H_2O \rightarrow ...q... + 3NaH_2PO_2$

(iii) $PH_4I + KOH \rightarrow KI + H_2O + ...r...$ p, q and r respectively are

A. PH_3, H_3PO_3, PI_3

B. PH_3, PH_3, PH_3

C. PCl_3, H_3PO_4, PH_3

D. PCl_5, PH_3, P_4O_6

Answer: B

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3. Match the column I with Column II and mark the appropriate choice.

	Column I		**Column II**
(p)	State function	(i)	At constant pressure
(q)	$\Delta H = q$	(ii)	Specific heat
(r)	$\Delta U = q$	(iii)	Entropy
(s)	Intensive property	(iv)	At constant volume

A. (p) - (iii), (q) - (i), (r) - (iv), (s) - (ii)

B. (p) - (ii), (q) - (iv), (r) - (i), (s) - (iii)

C. (p) - (ii), (q) - (iv), (r) - (iii), (s) - (i)

D. (p) - (iii), (q) - (ii), (r) - (i), (s) - (iv)

Answer: A

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4. Match the column I with Column II and mark the appropriate choice.

	Column I		Column II
(p)	NaH	(i)	Interstitial hydride
(q)	CH_4	(ii)	Molecular hydride
(r)	$VH_{0.56}$	(iii)	Ionic hydride
(s)	B_2H_6	(iv)	Electron-deficient hydride

A. (p) - (ii), (q) - (iv), (r) - (ii), (s) - (i)

B. (p) - (ii), (q) - (iv), (r) - (iii), (s) - (i)

C. (p) - (i), (q) - (ii), (r) - (iv), (s) - (iii)

D. (p) - (iii), (q) - (ii), (r) - (i), (s) - (iv)

Answer: D

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5. Monoclinic sulphur is an example of monoclinic cystal system. What are the characteristics of the crystal system ?

A. $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$

B. $a \neq bbec, \alpha \neq \beta \neq \gamma \neq 90^\circ$

C. $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$

D. $a \neq b \neq c, \alpha = \gamma = 90^\circ, \beta \neq 90^\circ$

Answer: D

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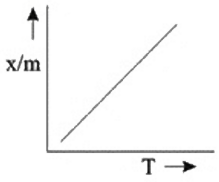
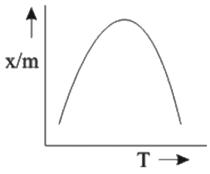
6. Which of the plots is adsorption isobar for chemisorption?

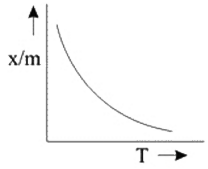
A.



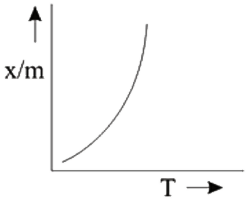
B.



C.



D.



Answer: B

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7. Select the correct option, among Sc(III) , Ti(IV), Pd(II) and Cu(II) ions

A. all are paramagnetic

B. all are diamagnetic

C. Sc (III), Ti (IV) are paramagnetic and Pd (III), Cu(II) are diamagnetic

D. Sc(III), Ti (IV) are diamagnetic and Pd (II), Cu (III) are paramagnetic

Answer: D

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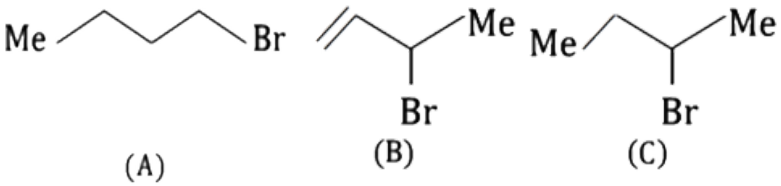
8. Consider the following bromides



The correct order of S_N1 reactivity is

A. $A > B > C$

B. $B > C > A$

C. $B > A > C$

D. $C > B > A$

Answer: B

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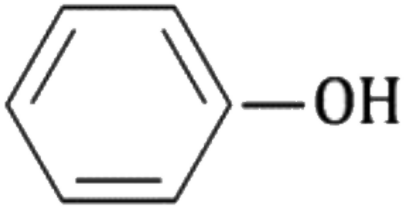
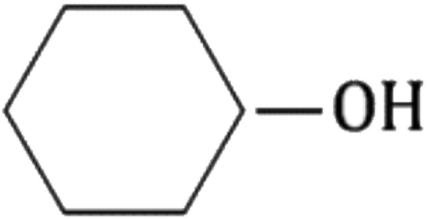
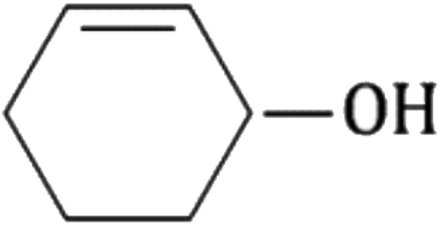
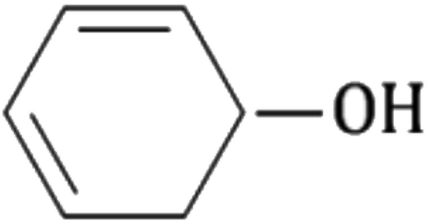
9. Dehydration of the following in increasing order is

(I) 

(II) 

(III) 

(IV) 

A. $I < II < III < IV$

B. $II < III < IV < I$

C. $I < III < IV < II$

D. None of these

Answer: A

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10. The half-life for radioactive decay of $.^{14}C$ is 5730 years . An archaeological artifact containing wood had only 80% of the $.^{14}C$ found in a living tree. Estimate the age of the sample.

A. 1845 years

B. 184.5 years

C. 1900 years

D. 190 years

Answer: A

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11. Complete the missing links

$$CH_3CHBrCH_3 \xrightarrow{\text{alc. KOH}} X \xrightarrow{\text{HBr, Peroxiden}} Y \xrightarrow{CH_3Ona} Z$$

	X	Y	Z
A.	$CH_3CH=CH_2$	$CH_3CH(Br)CH_2Br$	$CH_3CH(OH)CH_3$
B.	$CH_3CH=CH_2$	$CH_3CH_2CH_2Br$	$CH_3CH_2OCH_2CH_3$
C.	$CH_3CH=CH_2$	$CH_3CH(Br)CH_3$	$CH_3CH_2OCH_2CH_3$
D.	$CH_3CH=CH_2$	$CH_3CH_2CH_2Br$	$CH_3CH_2CH_2OCH_3$

Answer: D

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12. The freezing point of 1 molal $NaCl$ solution assuming $NaCl$ to be $100\,\%$ dissociated in water is:

A. $-1.86^\circ C$

B. $-3.72^\circ C$

C. $+1.86^{\circ}C$

D. $+3.72^{\circ}C$

Answer: B

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13. $\begin{matrix} COOH \\ | \\ COOH \end{matrix} \xrightarrow{NaOH} X,$

The product (X) will be

A. $\begin{matrix} CH_2ONa \\ | \\ COONa \\ COOH \end{matrix}$

B. $\begin{matrix} | \\ COOH \\ COONa \end{matrix}$

C. $\begin{matrix} | \\ COONa \\ CH_2OH \end{matrix}$

D. $\begin{matrix} | \\ CH_2OH \end{matrix}$

Answer: C

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14. $NaBH_4 + I_2 \rightarrow X + Y + Z$

$BF_3 + LiAlH_4 \xrightarrow{450\ K} X + P$

$BF_3 + LiAlH_4 \rightarrow X + Q + R$

X, Y, Z, P, Q and R in the reactions are

A.

X	Y	Z	P	Q	R
$Na_4B_4O_7$	NaI	HI	HF	AlF_3	LiF

B.

X	Y	Z	P	Q	R
B_2H_6	NaI	H_2	NaF	LiF	AlF_3

C.

X	Y	Z	P	Q	R
B_2H_6	BH_3	NaI	$B_3N_3H_6$	Al_2F_6	AlF_3

D.

X	Y	Z	P	Q	R
BH_3	B_2H_6	H_2	$B_3N_3H_6$	LiF	AlF_3

Answer: B

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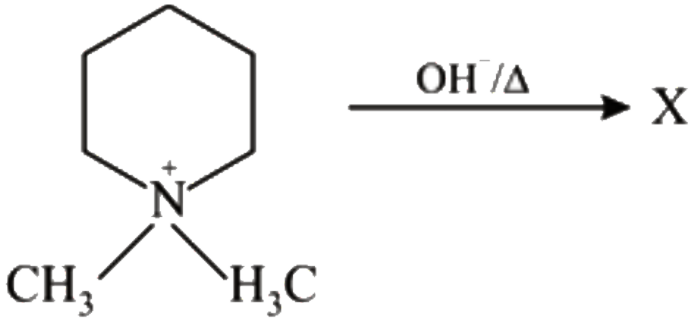
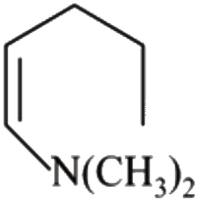
15. In the following reaction,

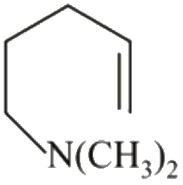


The organic product X has the structure

A.

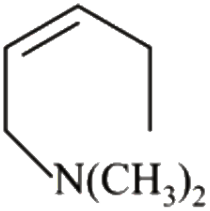


B.



C.

D.



Answer: C

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16. Which of the following are arranged in the decreasing order of dipole moment ?

A. CH_3Cl, CH_3Br, CH_3F

B. CH_3Cl, CH_3F, CH_3Br

C. CH_3Br, CH_3Cl, CH_3F

D. CH_3Br, CH_3F, CH_3Cl

Answer: B

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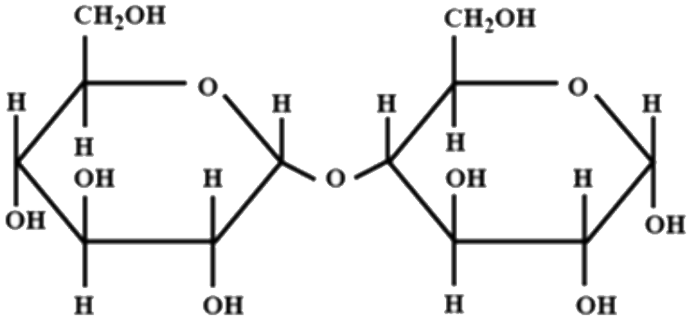
17. Study the structure of maltose and mark the incorrect statement.



A. Maltose is composed of two $\alpha - D -$ glucose units

B. C - 1 of one glucose is linked to C - 4 of other unit

C. It is a non - reducing sugar

D. It is a disaccharide

Answer: C

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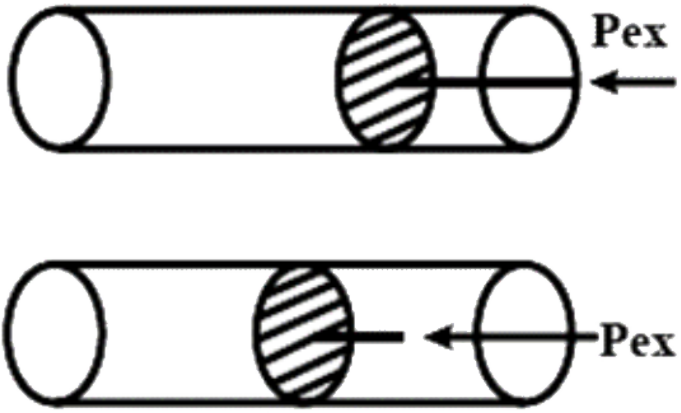
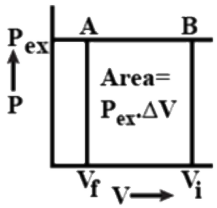
18. Work done on a ideal gas in a cylinder when it is compressed by an external pressure in a single step is shown below :

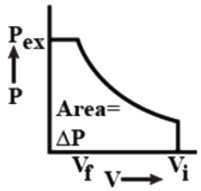


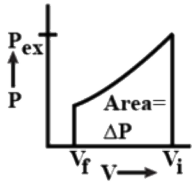
Which of the following graphs will show the work done on the gas?

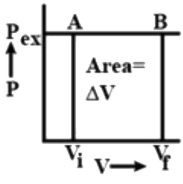
A.



B.



C. 

D. 

Answer: A

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19. Sometimes it is possible to separate two sulphide ores by adjusting the proportion of oil to water or by using depressant NaCN is added to an ore conaining ZnS and PbS, what is the correct observation?

A. NaCN prevents PbS from coming to the froth but allows ZnS to come with froth

B. NaCN prevents ZnS from coming to the froth but allows PbS to come with froth

C. NaCN prevents frothing of both ZnS and PbS, hence no froth is formed

D. NaCN does not act as depressant hence a mixture of PbS and ZnS is found in froth

Answer: B

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20. Match the atomic numbers of the elements given in column I with the periods given in column II and mark the appropriate choice.

Column-I (Atomic Number)		Column-II (Period)	
A)	31	i)	5
B)	50	ii)	3
C)	56	iii)	4
D)	14	iv)	6

A. (p) - (i), (q) - (ii), (r) - (iii), (s) - (iv)

B. (p) - (ii), (q) - (i), (r) - (iv), (s) - (iii)

C. (p) - (iii), (q) - (iv), (r) - (i), (s) -(ii)

D. (p) - (iii), (q) - (i), (r) - (iv), (s) -(ii)

Answer: D

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21. The drain cleaner Drainex contains small bits of aluminium which react with caustic soda to produce hydrogen What volume of hydrogen at $20^{\circ}C$ aand one bar will be released when $0.15g$ of aluminium reacts ? .

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22. In the complex $K_4\left[Th(C_2O_4)_2(H_2O)_2\right]$. If coordination number is X and oxidation number of Th is Y. The sum of $X+Y$ is ?

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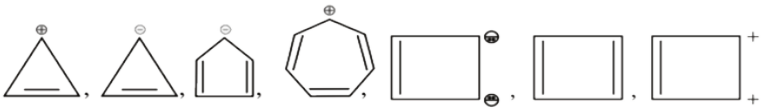
23. How many these compounds/Ions are aromatic here?



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24. How many of these metals can displace H_2 easily from acids.

$Fe, Mg, Al, Cu, Ag, Au, Zn$

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25. How many of these carbocations are more stable than $(CH_3)_3C^+$

$pH - \overset{+}{C}H_2, (Ph)_2\overset{+}{C}H, (Ph)_3\overset{+}{C}, (CH_3)_2\overset{+}{C}H, CH_3O - \overset{+}{C}H_2, \Delta - \overset{+}{C}H_2, \square -$

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