CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 66

Chemistry

1. The first (IE_1) and second (E_2) ionization energies (kJ/mol) of few elements designated by

Roman numerals are given below. Which of these would be an alkali metal?

A.

	IE_1	IE_2
I	2372	5251

B.

	IE_1	IE_2
II	520	7300

C.

	IE_1	IE_2
III	900	1760

D.

	IE_1	IE_2
IV	1680	3380

Answer: B

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2. A metal of density $7.5 \times 10^3 kgm^{-3}$ has an fcc crystal structure with lattice parameter $a = 400 \pm$. Calculater the number of unit cells present in $0.015kg$ of metal.

A. 6.250×10^{22}

B. 3.125×10^{23}

C. 3.125×10^{22}

D. 1.563×10^{22}

Answer: C

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3. The wavelength of the third line of the Balmer series for a hydrogen atom is -

A. $\frac{21}{100R_H}$

B. $\frac{100}{21R_H}$

C. $\frac{21R_H}{100R}$

D. $\frac{100R_H}{21}$

Answer: B

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

	Column I		Column II
(p)	Clark's method	(i)	$Na_6P_6O_{18}$
(q)	Calgon's method	(ii)	$NaAlSiO_4$
(r)	Ion-exchange method	(iii)	RSO_3H
(s)	Synthetic resins method	(iv)	$Ca(OH)_2$

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

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

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

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

Answer: D

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5. Calculate the half life of the first-order reaction:

$C_2H_4O(g) \rightarrow CH_4(g) + CO(g)$

The initial pressure of $C_2H_4O(g)$ is $80mm$ and the total pressure at the end of $20\ \min$ is $120mm$.

A. 40 min

B. 120 min

C. 20 min

D. 80 min

Answer: C

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6. For the reaction, $AB(g) \Leftrightarrow A(g) + B(g), AB$ is 33% dissociated at a total pressure of 'p' Therefore, 'p' is related to K_p by one of the following options

A. $p = K_p$

B. $p = 4K_p$

C. $p = 3K_p$

D. $p = 8K_p$

Answer: D

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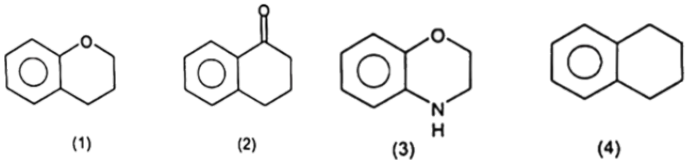
7. Rank the following compounds in decreasing order of reactivity in electrophilic aromatic

substitution reaction



A. $3 > 1 > 2 > 4$

B. $4 > 3 > 2 > 1$

C. $3 > 1 > 4 > 2$

D. $1 > 3 > 4 > 2$

Answer: C

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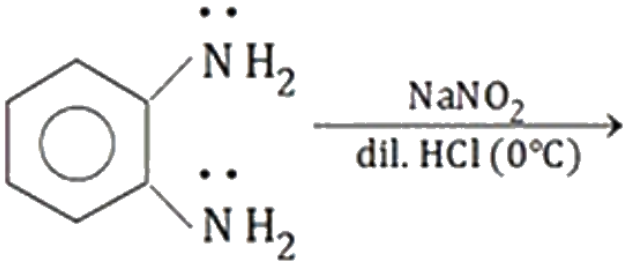
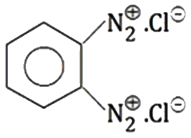
8. The major product of the reaction is



A.



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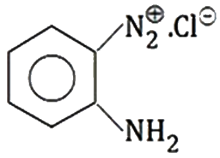
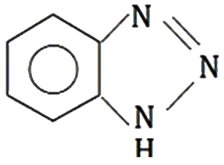
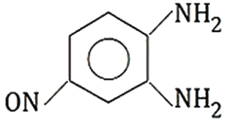


C.



D.



Answer: C

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9. The element A burns in nitrogen to give an ionic compound B. The compound B react with water to give C and D. A solution of C becomes milky on bubbling carbon dioxide. What is the nature of compound D?

A. Acidic

B. Basic

C. Amphoteric

D. Neutral

Answer: B

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10. How long will it take for a uniform current of 6.00 A to deposit 78 g of gold from a solution of $AuCl_4^-$? What mass of chlorine gas will be formed simultaneously at anode of the cell?

(Atomic mass of Au = 197)

A. t = 3010 sec, w = 35.50 g

B. t = 20306 sec, w = 45.54 g

C. t = 19500 sec, w = 54.5 g

D. t = 19139.16 sec, w = 42.24 g

Answer: D

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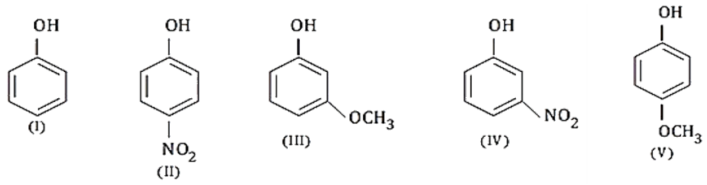
11. Mark the correct order of decreasing acid strength of the following compounds.



A. (V) gt (IV) gt (II) gt (I) gt (III)

B. (II) gt (IV) gt (I) gt (III) gt (V)

C. (IV) gt (V) gt (III) gt (II) gt (I)

D. (V) gt (IV) gt (III) gt (II) gt (I)

Answer: B

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12. For real gases, the relation between P, V and T is given by an van der Waals equation, $\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT.$

For the following gases CH_4, CO_2, O_2, H_2 which gas will have (i) highest value of 'a' and (ii) lowest value of 'b' respectively?

A. $(i)CO_2, (ii)H_2$

B. $(i)CH_4, (ii)CO_2$

C. $(i)H_2, (ii)CO_2$

D. $(i)O_2, (ii)H_2$

Answer: A

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13. The number of geometrical isomers for octahedral $\left[Co(NH_3)_2Cl_4\right]^-$ and square planar $\left[AuCl_2Br_2\right]^-$ respectively are :

A. Two cis and trans, no geometrical isomers

B. Two cis and trans, two cis and trans

C. No geometrical isomers, two cis and trans

D. No geometrical isomers, no geometrical isomer

Answer: B

14. The relative lowering of vapour pressure of an aqueous solution containing a non-volatile solute, is 0.0125. The molality of the solution is

A. 0.70 m

B. 0.50 m

C. 0.80 m

D. 0.40 m

Answer: A

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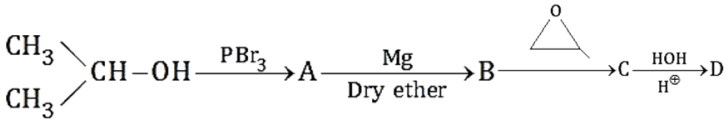
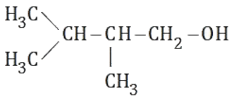
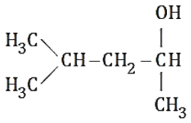
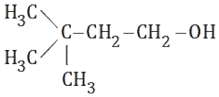
15. Final product D in the sequence of reaction is



A. 

B. 

C. 

D. $H_3C - \underset{\displaystyle CH_3}{\overset{\displaystyle OH}{\overset{|}{\underset{|}{C}}}} - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

Answer: B

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16. An organic liquid A containing C, H and O has a pleasant odour with a boiling point of $78^{\circ}C$. On boiling. A with conc. H_2SO_4 a colourless gas is produced which decolourises bromine water and alkaline $KMnO_4$. One mole of this gas also takes one mole of H_2. The organic liquid A is

A. C_2H_5Cl

B. $C_2H_5COOCH_3$

C. C_2H_5OH

D. C_2H_6

Answer: C

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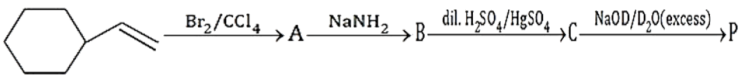
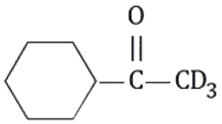
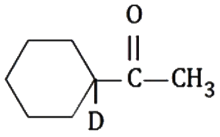
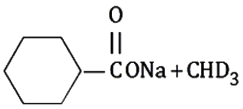
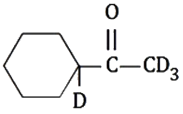
17. Final product (p) in the sequence of reaction is



A. 

B. 

C. 

D. 

Answer: D

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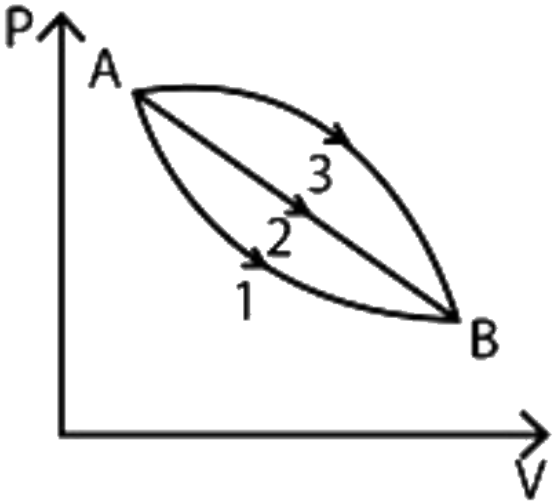
18. A given mass of gas expands from state A to state B by three paths 1, 2 and 3 as shown in the figure



If w_1, w_2 and w_3 respectively are be the works done by the gas along three paths, then

A. $w_1 > w_2 > w_3$

B. $w_1 < w_2 < w_3$

C. $w_1 = w_2 = w_3$

D. $w_1 < w_2, w_1 < w_3$

Answer: B

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19. Consider the following substances :

1. OF_2 2. Cl_2O 3. Br_2O

The correct sequence X - O - X bond angle is

A. 1 gt 2 gt 3

B. 3 gt 2 gt 1

C. 2 gt 1 gt 3

D. 1 gt 3 gt 2

Answer: B

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20. Which of the following reactions is taking place resulting in discolouration of marble of the buildings like Taj Mahal?

A.

$$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 + H_2O + CO_2$$

B.

$$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$$

C. $CaCO_3 + H_2O \rightarrow Ca(OH)_2 + CO_2$

D. $CaCO_3 \rightarrow CAO + CO_2$

Answer: A

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21. Plot of log against log P is a straight line inclined at an angle of 45°. When the pressure is 0.5 atm and Freundlich parameter ,K is 10, the amount of solute adsorbed per gram of adsorbent will be : (log 5=0.6990)

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22. In carprolactum if 'a' is number of lone pairs of e^- and 'b' is number of sp^3 hybridised atoms. What is the vlaue of $a + b$?

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23. In borax is m is number of hydroxy groups and 'n' is number of water molecules. What is the sum of $m + n$?

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24. In borax is m is number of hydroxy groups and 'n' is number of water molecules. What is the sum of $m + n$?

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25. A weak acid HX has the dissociation constant $1 \times 10^{-5} M$. It forms a salt NaX on reaction with alkali. The percentage hydrolysis of $0.1M$ solution of NaX is

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