CHEMISTRY

VMC MODULES ENGLISH

MOCK TEST 13

Chemistry Section 1

1. For following reactions

$A \xrightarrow{400K}$ Product

$A \xrightarrow[\text{catalyst}]{200\text{K}}$ Product

it was found that the E_a is decreased by 20 kJ / mol in

the presence of catalyst. If the rate remains unchanged, the activation energy for catalysed reaction is (Assume per exponential factor is same) :

A. $40kj/mol$

B. $20kj/mol$

C. $80kj/mol$

D. $35kj/mol$

Answer: B

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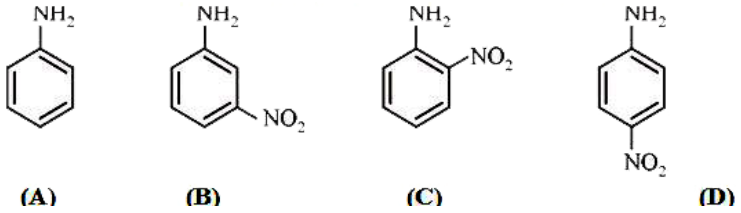
2. The increasing order of pK_b for the following amines is:



(A) (B) (C) (D)

A. $3 < 2 < 4 < 1$

B. $1 < 2 < 3 < 4$

C. $1 < 2 < 4 < 3$

D. $1 < 3 < 2 < 4$

Answer: C

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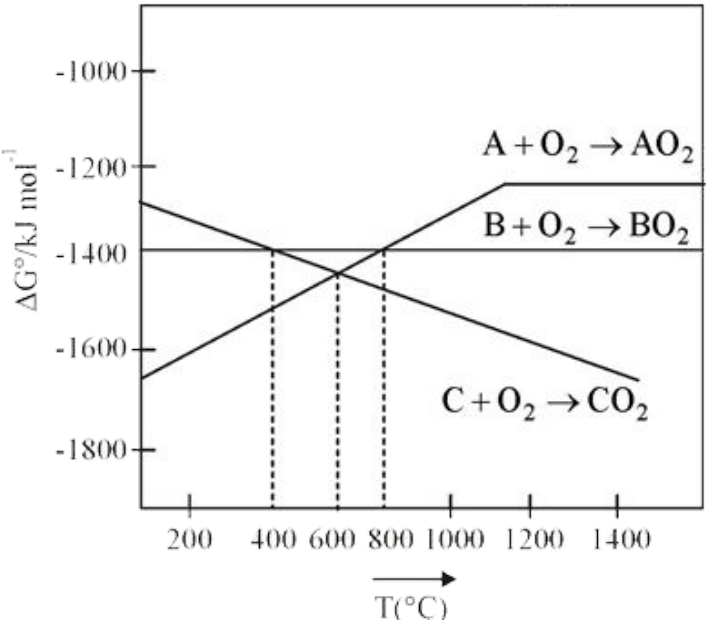
3. According to the following diagram, which of the following option is correct?



A. B can reduce CO_2 above $800^\circ C$

B. C can reduce AO_2 below $600^\circ C$

C. Both B and A can reduce CO2 above $400^\circ C$

D. A can reduce both BO_2 and CO_2 below $600^\circ C$

Answer: D

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4. Al has a smaller first ionization enthalpy than Mg. Consider the following statements :

I. It is easier to remove 3p electron than 3s electron .

II . 3p electron of Al is more shielded from the nucleus by the inner coreof electron than the 3s electrons of Mg

III. 3s electron hasmore penetration power than 3p electron

IV. Atomic radius of Al is more than Mg (atomic

number Al=13, Mg = 12)

The correct statements are :

A. I, II, and IV

B. I, II and III

C. II, III and IV

D. I, III and IV

Answer: B

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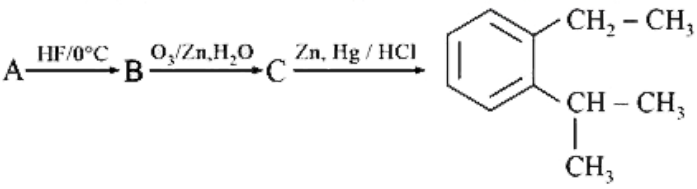
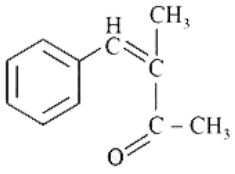
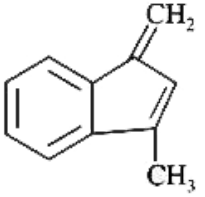
5. Identify (A) in the following reaction sequence :



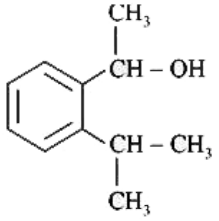
A.



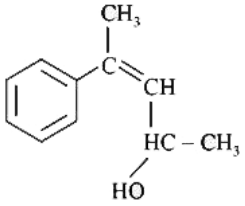
B.



C.



D.



Answer: D

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6. The number of wave made by electron in one complete revolution in third Bohr's orbit are :

A. nine

B. zero

C. six

D. three

Answer: D

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7. 1 equivalent of complex X of composition $Co(NH_3)_5Cl_n$ reacts with two equivalent of $AgNO_3$ and does not show geometrical isomerism. The IUPAC nomenclature of X is :

A. Hexaamminecobalt(III) chloride

B. Pentaamminechlorocobalt(III) chloride

C. Tetramminedichlorocobalt(III) chloride

D. Triamminetrichlorocobalt(III) chloride

Answer: B

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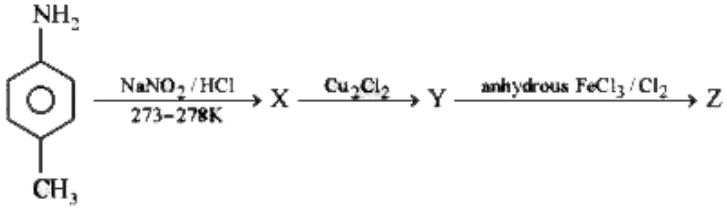
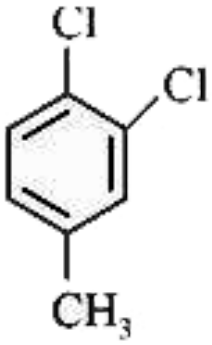
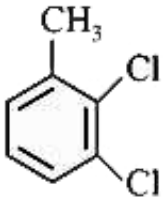
8. The major product Z obtained in the following reaction scheme is :



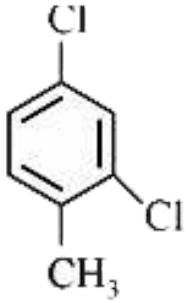
A.



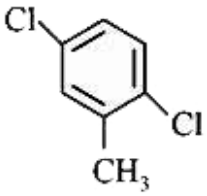
B.



C.



D.



Answer: C

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9. Enthalpy of the reaction

$CH_4 + \frac{1}{2}O_2 \rightarrow CH_3OH$, is negative, if enthalpy of

combustion of CH_4 and CH_3OH are x and y respectively, then which relation is correct ?

A. $x \geq y$

B. $x = y$

C. $x > y$

D. $x < y$

Answer: D

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10. A compound gives negative test with ninhydrin and positive test with benedicts solution. The

compound is

A. A protein

B. An amino acid

C. A lipid

D. A monosaccharide

Answer: D

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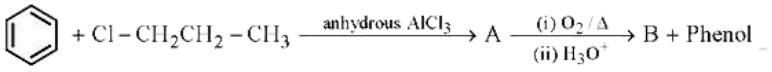
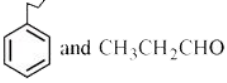
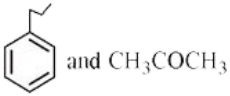
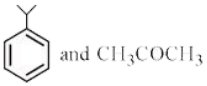
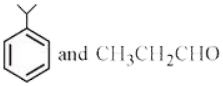
11. 

The major products A and B are :

A.  and CH_3CH_2CHO

B.  and CH_3COCH_3

C.  and CH_3COCH_3

D.  and CH_3CH_2CHO

Answer: C

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12. The K_{sp} for the following dissociation is 2.2×10^{-2}

$PbCl_{2(s)} fPb^{2+}_{(aq)} + 2Cl^{-}_{(aq)}$

Which of the following choices is correct for a mixture of 350mL 0.225M $Pb(NO_3)_2$ and 200 mL 0.6 M NaCl ?

A. $Q > K_{sp}$

B. $Q = K_{sp}$

C. Not enough data provided

D. $Q < K_{sp}$

Answer: D

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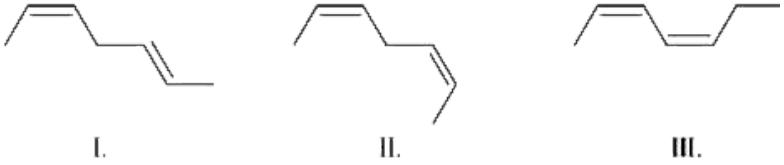
13. The correct order of heat of combustion for following alkadiene is :



I. II. III.

A. $I < III < I$

B. $I < II < III$

C. $I < III < II$

D. $III < I < II$

Answer: D

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14. The compound that canact both as oxidixising and reducing agent is :

A. KO_2

B. Mn_2O_7

C. Al_2O_3

D. SO_3

Answer: A

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15. The acidic, basic and neutral oxides respectively are :

A. SO_3, Al_2, CO_2

B. MgO, CaO, CO

C. CO_2, MgO, N_2O

D. N_2O, CaO, NO

Answer: C

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16. Which of the following halide of group 13 elements does not exists:

A. Thalium (I) iodide

B. Thalium (III) iodide

C. Thalium (I) triiodide

D. Bis-aluminium (III) iodide

Answer: B

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17. The major product (Y)in the following reaction sequency is :

$$CH_3 - \overset{CH_3}{\overset{|}{C}}H - CH = CH_2 \xrightarrow{Br_2 / H_2O} X \xrightarrow{\text{conc.}H_2SO_4 / \Delta} Y$$

A. $CH_3 - \overset{CH_3}{\overset{|}{\text{CH}}} - CH = CH - Br$

B. $CH_3 - \underset{\text{H}}{\overset{CH_3}{\overset{|}{\underset{|}{\text{C}}}}} - \underset{Br}{\underset{|}{C}} = CH_2$

C. $CH_3 - \overset{CH_3}{\overset{|}{C}} - \underset{Br}{\overset{|}{C}} - CH_3$

D. $CH_3 - \overset{CH_3}{\overset{|}{C}} = CH - CH_2 - Br$

Answer: D

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18. The magnetic moment of two dioxygen species x and y are 2.83 & 1.73 BM Which of the following option is always correct about the above species.

A. Bond order of x gt y

B. Bond order of y gt x

C. x is O_2 and y is O_2^-

D. x is O_2

Answer: D

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19. The electronic configuration of tetravalent terbium and divalent ytterbium are :

(Atomic number : Xe = 54, Tb = 65, Yb = 70)

A. $[Xe]4f^8$ and $[Xe]4f^{13}$

B. $[Xe]4f^7$ and $[Xe]4f^{14}$

C. $[Xe]4f^8 6s^1$ and $[Xe]4f^{13}6s^1$

D. $[Xe]4f^8$ and $[Xe]4f^{14}$

Answer: B

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20. (i) $\left[Co(H_2O)_6\right]^{n-6}$

(ii)$[PtCl_2BrF]^{2-}$ m geometrical isomers

The spin only magnetic moment of complex (i) is 3.87 .

The value of $m+n$ is

A. 8

B. 9

C. 10

D. 11

Answer: D

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Chemistry Section 2

1. The hardness of water sample (in term of equivalengt of $CaCO_3$) containing 10^{-3}M $CaSO_4$ is :

(Molar mass of $CaSO_4 = 136g/\text{mol}$)

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2. The mass percentage of nitrogen in histidine is _____.

[Atomic mass H=1,C =12, N = 14, O =16]

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3. The normality of H_2SO_4 in a sample which has density $1.5g/mL$ and mass percentage of 49% is .....

(Molecular weight of $H_2SO_4 = 98$)

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4. Electrolysis of dilute aqueous NaCl solution was carried out by passing 10A current. The timerequired (in seconds) to liberate 0.01 moles of H_2 gas at the cathode is : $[1F = 96500C]$

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5. How much amount of NaCl in g should be added to900 g of water $(\rho = 1.00g/mL)$ to decrease the freeezing point of water to $-0.3^\circ C$ _____ . (The freezing point depression constant for water $= 3Kkgmol^{-1}$ Atomic mass : H =1 , O =16,Na = 23 , Cl = 35.5)

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