

(Q.1) Match the forces with the variation of distance between molecules

Column-I

1. Ion-ion

2. Dipole-dipole

3. London dispersion

Column II

a) $1/r$

b) $1/r^2$

c) $1/r^3$

d) $1/r^6$

(A) 1a 2c 3d

(B) 1a 2b 3c

(C) 1b 2c 3d

(D) 1b 2a 3c

Ans: (C)

Solution interionic force $\propto \frac{1}{r^2}$ $\left(\frac{kq_1q_2}{r^2}\right)$

dipole dipole force $\propto \frac{1}{r^3}$

dispersion forces $\propto \frac{1}{r^6}$ (weakest force)

Q. If the toilet cleaner chemical falls in your hand, which one of the following you use to Relief

1. aq. NH_3 2. Vinegar 3. aq. NaOH 4. NaHCO_3

Ans. (4)

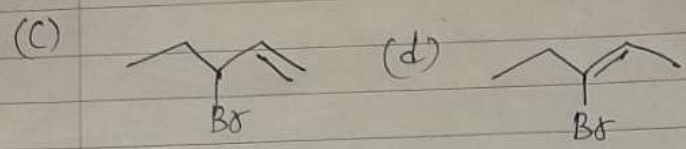
Solution - Toilet cleaner is acidic to get relief we can use basic substance like NaHCO_3 (baking soda)

NaOH & aq. NH_3 are also basic but these are harmful to skin, so not used

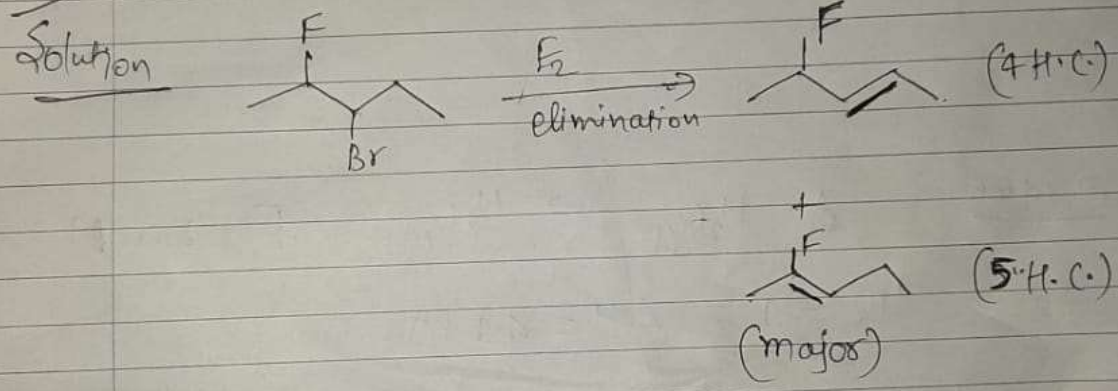
Q.1

3-bromo-2-fluoropentane undergoes

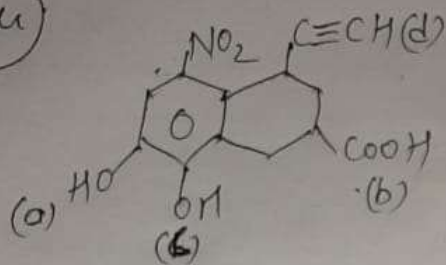
E_2 reaction. find the product



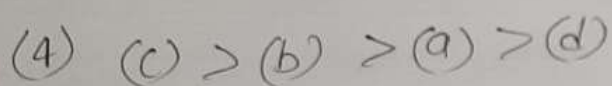
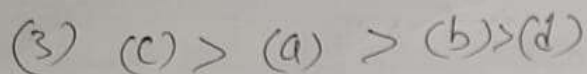
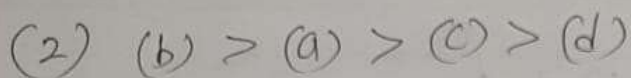
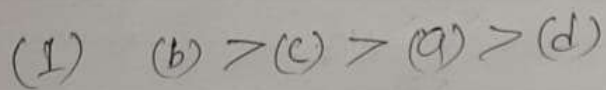
Ans: (a)



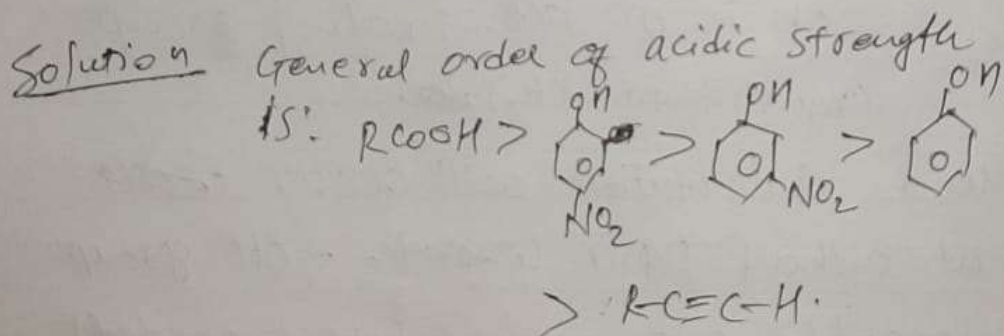
(Q)



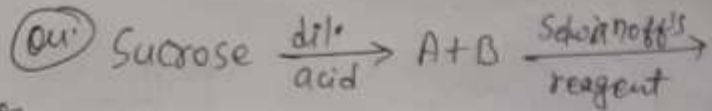
Correct order of acidic strength will be



Ans. (1)



~~Sugar~~



D) ~~identity test~~ colour obtained in this reaction is

(1) Violet (2) black (c) blue (d) Red

~~Ans. (4)~~

Ans. (4)

Solution :- The reagent used are
resorcinol & HCl.

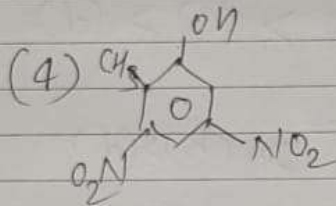
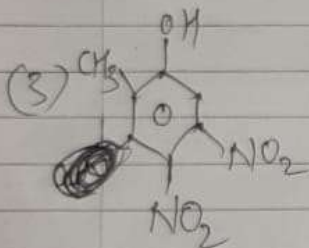
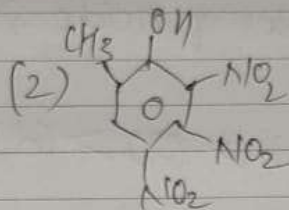
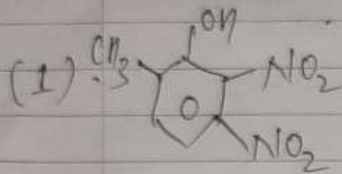
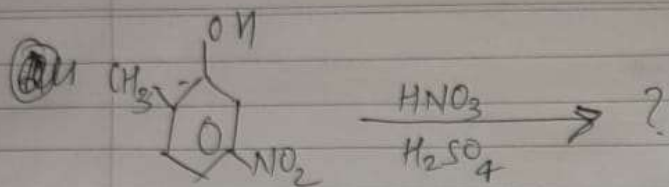
It is used to distinguish aldose & ketose

Sugars -

Ketose - rapidly gives red colour

(Ex. Fructose)

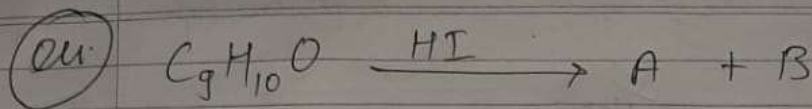
Aldose - slower pink colour forms



Ans: (3)

Solution: -OH is an activating group
(more than -CH₃) ~~also~~.

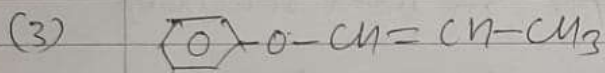
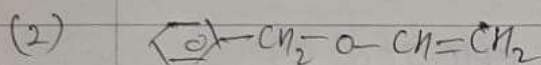
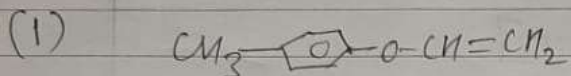
Hence, substitution will occur ~~at~~
at ortho & para w.r.t. -OH group
(preferably at para - as less crowded)



A = gives yellow ppt. with $AgNO_3$

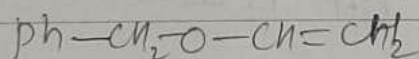
B = give +ve iodoform test after tautomerisation

Identify the compound.

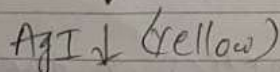
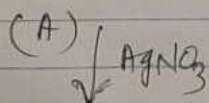
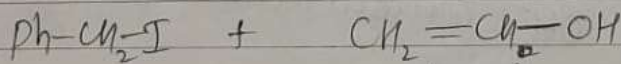


Ans: (2)

Solution

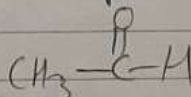


$\downarrow HI$

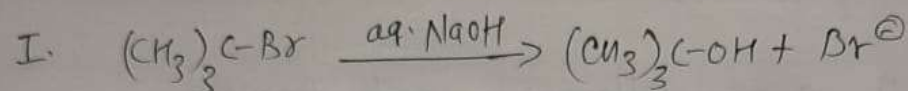


(enol)

$\uparrow\uparrow$ tautomerise

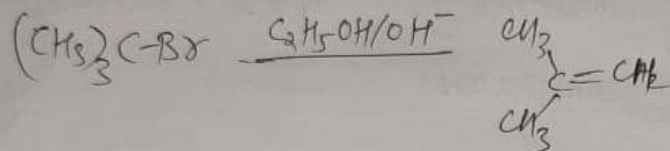


Q4. Identify correct statement w.r.t. to following reactions



$$\text{Rate} = k [(\text{CH}_3)_3\text{C-Br}]$$

II



$$\text{Rate} = [(\text{CH}_3)_3\text{C-Br}] [\text{OH}^-]$$

1. Rate of Reaction is not affected by change of conc. of OH^- in both reactions
2. Rate of Reaction does not change when conc. of OH^- changes, for reaction-I only.
3. Rate of both reactions become double when conc. of OH^- is doubled.
4. Rate of Reaction does not change with change of OH^- concentration for II reaction

Ans: (2)

Solution - observe given kinetics of the reactions.

Q. Find the sum of ox. no. of transition metals in $K_2Cr_2O_7$, $KMnO_4$ & $K_2[FeO_4]$

Integer type

Ans. (19)

Solution] Ox. no. of Cr in $K_2Cr_2O_7 = +6$

Ox. no. of Mn in $KMnO_4 = +7$

Ox. no. of Fe in $K_2[FeO_4] = +6$

Q. ~~A saturated hydrocarbon~~ A Compound ~~has~~ (mol. wt. = 62) has
Integer C:H = 4:1 & C:O = 3:4 (mass ratio),

Calculate the moles of O_2 required for
the combustion of two moles of this compound.

Ans (5)

Solution $\frac{W_C}{W_H} = \frac{4}{1}$ & $\frac{W_C}{W_O} = \frac{3}{4} \Rightarrow W_C : W_O : W_H$
 $= 12 : 16 : 3$

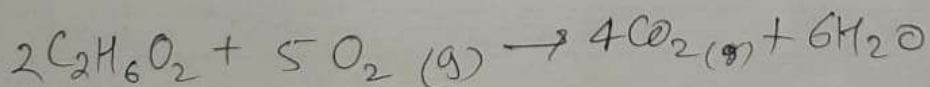
$$n_C : n_O : n_H = \frac{12}{12} : \frac{16}{16} : \frac{3}{1} = 1 : 1 : 3$$

So, its empirical formula will be CH_3O

~~if its general formula $C_nH_{2n+2}O$~~

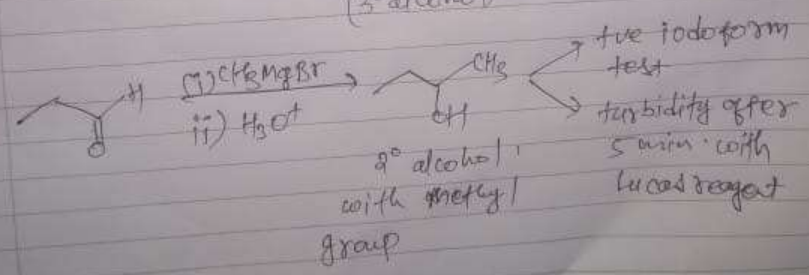
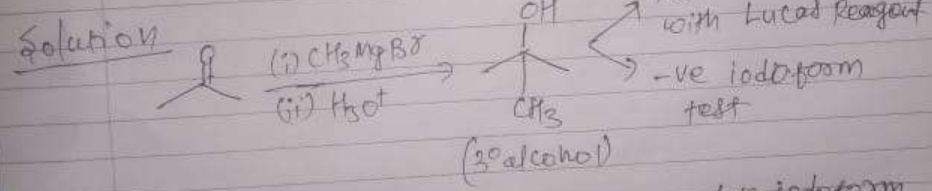
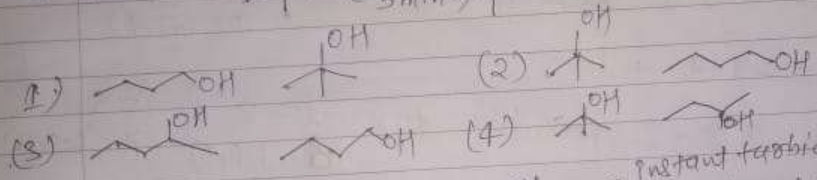
$$\left. \begin{array}{l} \text{empirical mass} = 31 \\ \text{mol. mass} = 62 \end{array} \right\} n = 2$$

$$\text{mol. f.} = C_2H_6O_2$$



Q. Acyclic compounds, A & B having same molecular formula C_3H_8O , react with CH_3MgBr to give products C & D respectively. Identify C & D with the help of following information.

	Lucas test	Iodoform test
C	+ve (instant)	-ve
D	+ve (after 5 min.)	+ve



Ans (4)

Q: number of subshells having
 $n=4$ & $m=2$ can be.

- (1) 8 (2) 2 (3) 16 (4) 4

Ans: (2)

Solution ~~⊗~~ If $n=4$

then $l = \del{0} \text{ to } (n-1) = 0, 1, 2, 3$
(s) (p) (d) (f)

$m = -l \text{ to } +l$

So, $m = -2$ possible for $l=2$ & $l=3$
(d-subshell) (f-subshell)

Ques. A mango ~~is~~ shrinks when kept in concentrated solution of salt. The phenomenon responsible for this is.

- 1) Dialysis
- 2) osmosis
- 3) reverse osmosis
- 4) diffusion

Ans. (2)

Solution → It occurs due to movement of solvent from low concentration (mango) to higher concentration (salt solution).

Q. which of the following pair of elements cannot form solid bicarbonates but can react with nitrogen gas to form nitrides

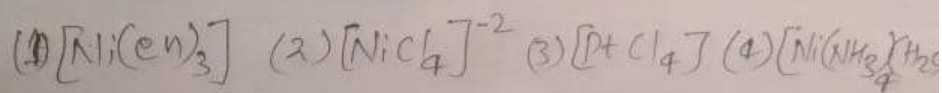
(A) Li, Mg (B) Cs, Rb (C) Na, Ca (D) Cs

Ans. (A)

Solution ~~except~~ all alkali metals can form solid bicarbonates, except Li.

∴ Alkali metals do not react with N_2 except Li.

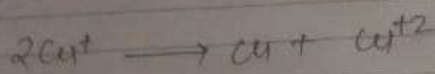
Q. Identify the complex which cannot show isomerism



Ans. (1)

Solution $[\text{NiCl}_4]^{-2}$ - is tetrahedral complex
→ It cannot show isomerism.

find $\ln k$ for:



Given $E_{\text{Cu}^+/\text{Cu}}^{\circ} = 0.52 \text{ V}$

$$E_{\text{Cu}^{2+}/\text{Cu}}^{\circ} = 0.16 \text{ V} \quad \left(\frac{RT}{F} = 0.025\right)$$

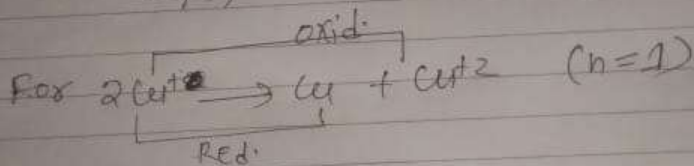
If $\ln k = x \times 10^{-1}$. The value of

x will be

ms: 144

Solution ~~log~~ $\Delta G^{\circ} = -RT \ln k$

$$\ln k = \frac{\Delta G^{\circ}}{-RT} = \frac{-nFE^{\circ}}{-RT} = \frac{E^{\circ}}{(RT/F)} = \frac{0.36}{0.025} = 14.4$$



$$\begin{aligned} E_{\text{redox}}^{\circ} &= E_{\text{Cu}^+/\text{Cu}}^{\circ} - E_{\text{Cu}^{2+}/\text{Cu}}^{\circ} \\ &= 0.52 - 0.16 = 0.36 \end{aligned}$$