FIITJEE RANKERS STUDY MATERIAL

JEE(ADVANCED), 2017

PHASE – IV

CHEMISTRY

Time: Two Hours ***Maximum Marks : 60***

Note:

i) This paper has two sections: **Section A** and **Section B.** Section **A** contains **10 questions of 2 marks each** Section **B** contains **10 questions of 4 marks each.**
ii) Separate answers are to be given on the separate pages.
iii) Attempt *all* questions.
iv) Use of logarithmic table is ***NOT PERMITTED.***
v) Use of calculator is ***NOT PERMITTED.***

Useful Data:

Gas Constant	**R**	=	$8.314\ J\ K^{-1}\ mol^{-1}$
		=	$0.0821\ Lit\ atm\ K^{-1}\ mol^{-1}$
		=	$1.987 \approx 2\ Cal\ K^{-1}\ mol^{-1}$
Avogadro's Number	N_a	=	6.023×10^{23}
Planck's constant	**h**	=	$6.625 \times 10^{-34}\ J \cdot s$
		=	$6.625 \times 10^{-27}\ erg \cdot s$
1 Faraday		=	96500 Coulomb
1 calorie		=	4.2 Joule
1 amu		=	$1.66 \times 10^{-27}\ kg$
1 eV		=	$1.6 \times 10^{-19}\ J$

Atomic No: H=1, He = 2, Li=3, Be=4, B=5, C=6, N=7, O=8, N=9, Na=11, Mg=12, Si=14, Al=13, P=15, S=16, Cl=17, Ar=18, K =19, Ca=20, Cr=24, Mn=25, Fe=26, Co=27, Ni=28, Cu = 29, Zn=30, As=33, Br=35, Ag=47, Sn=50, I=53, Xe=54, Ba=56, Pb=82, U=92.

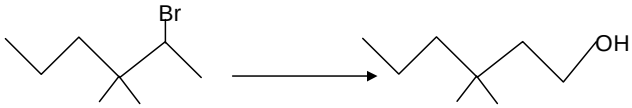
Atomic masses: H=1, He=4, Li=7, Be=9, B=11, C=12, N=14, O=16, F=19, Na=23, Mg=24, Al = 27, Si=28, P=31, S=32, Cl=35.5, K=39, Ca=40, Cr=52, Mn=55, Fe=56, Co=59, Ni=58.7, Cu=63.5, Zn=65.4, As=75, Br=80, Ag=108, Sn=118.7, I=127, Xe=131, Ba=137, Pb=207, U=238.

Name of the Candidate : ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

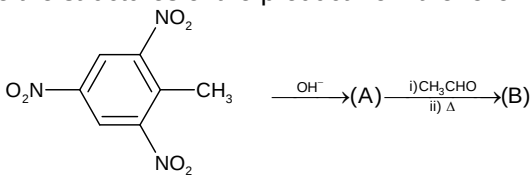
Enrollment Number : ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

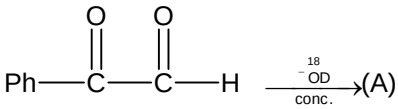
SECTION - A

1. Carryout the following transformations.

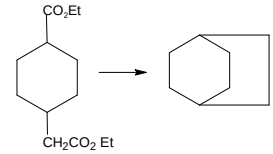


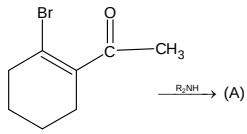
2. Give the structures of the product from the following condensation.



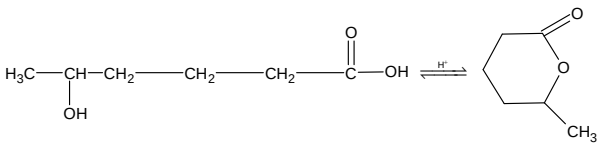
3. For the reaction  what is A?

4. Carry out the following conversion (3 steps)

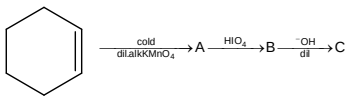


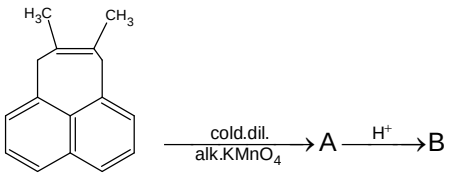
5. 

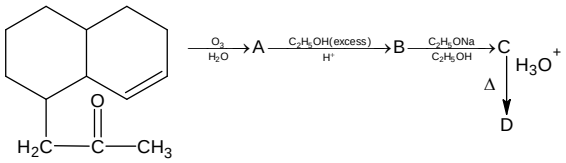
What are the structure of (A).

6. 

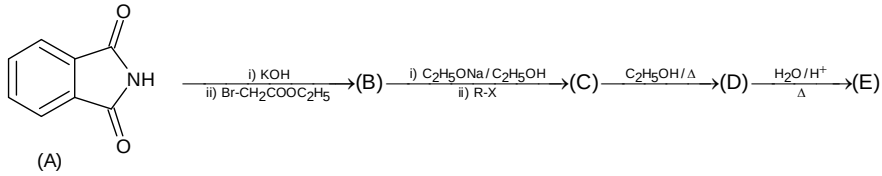
Show the mechanism for the above conversion.

7. 

8. 

9. 

10. Complete the following:

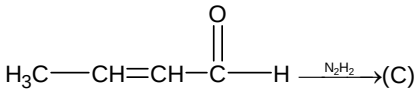


SECTION – B

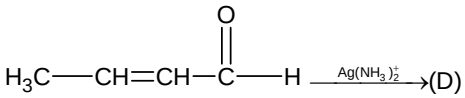
11. An organic compound (A) gives positive Liebermann reaction and on treatment with $CHCl_3$ / KOH followed by hydrolysis gives (B) and (C). Compound (B) gives colour with Schiff's reagent but not (C), which is steam volatile (C) on treatment with $LiAlH_4$ gives (D) $C_7H_8O_2$, which on oxidation gives (E). Give structures of (A) to (E) with proper reasoning.

12. Find the products

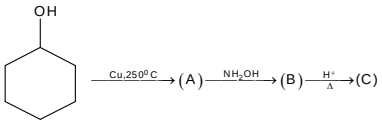
(a)



(b)



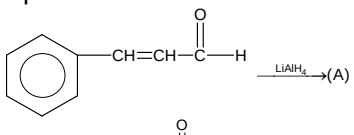
13. 2- aminoethanoic acid (Glycine) exists as dipolar ion, as does p-aminobenzensulphonic acid (sulphanilic acid) but p-aminobenzoic acid does not, explain why?

14. 

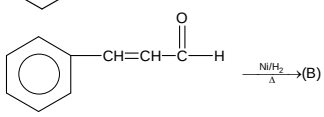
show the mechanism for formation of (C) from (B).

15. Find the products

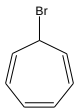
(A)



(B)



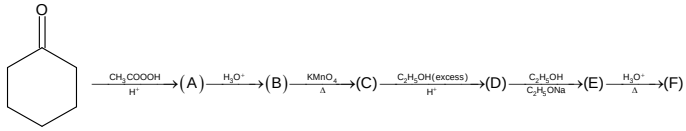
16. (a) What happens when the following compound (tropylium bromide) is treated with $AgNO_3$ solution? Give reasons in support of your observation.



(b) $CH_3 - CH = CHCHO \xrightarrow[KMnO_4]{\text{hot}} \text{Products}$

The products formed are treated with NaOH solution. Calculate the number of moles of NaOH needed to neutralize the products formed by reaction of one mole of the above compound with hot $KMnO_4$.

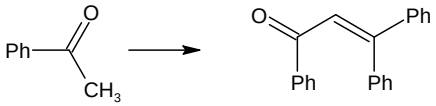
17.



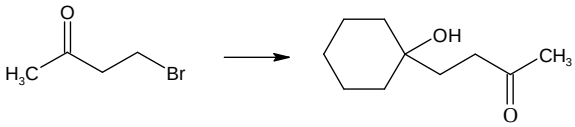
18. Compound A, C_8H_8O forms an orange precipitate with Brady's reagent & also gives positive test with Benedict's solution. Treatment of A with Br_2/OH^- yields $C_8H_6OBr_2$(B) which on treatment with caustic soda following acidification gives $C_8H_8O_3$(C). The later liberates CO_2 on treatment with $NaHCO_3$ and is resoluble. Identify A, B & C and gives mechanism of formation of C from B.

19. Convert the following

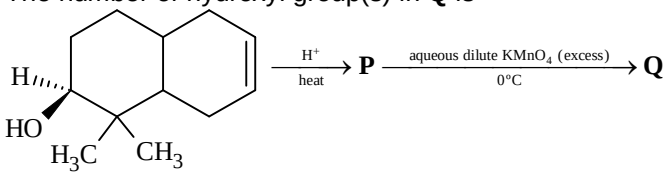
(i)



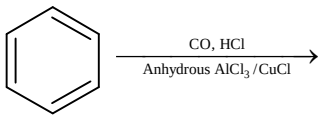
(ii)

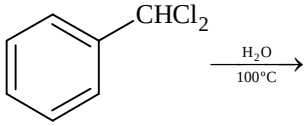


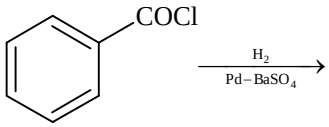
20. (a) The number of hydroxyl group(s) in **Q** is



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

I 

II 

III 

IV