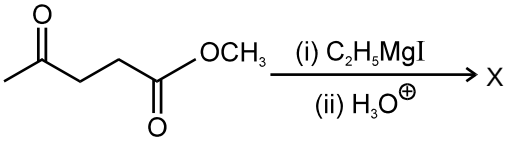
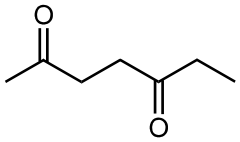
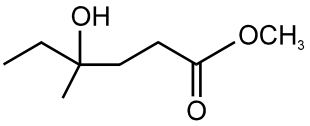
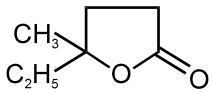
Self Practice Paper (SPP)

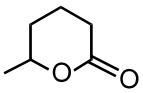
1. Give the structure of the compound X formed in the following reaction



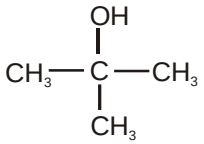
(1) 

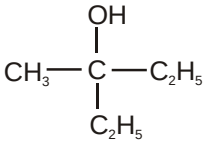
(2) 

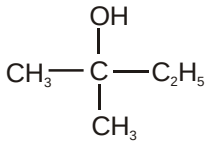
(3) 

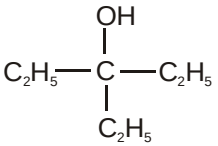
(4) 

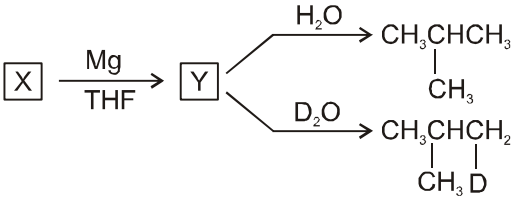
2. A sweet smelling compound(x) with molecular formula $C_8H_{16}O_2$ on reaction with excess of CH_3MgBr followed by acidification gives a single organic product(y), the structure of (y) can be :

(1) 

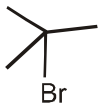
(2) 

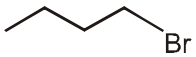
(3) 

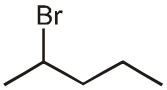
(4) 

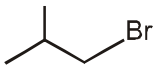
3. 

Give the structure of X.

(1) 

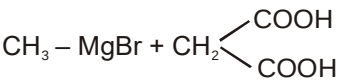
(2) 

(3) 

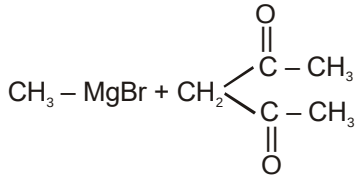
(4) 

4. In which of the following reaction CH_4 will be obtained.

(i) $CH_3 - Mg\ Br + CH_3 - C \equiv CH$

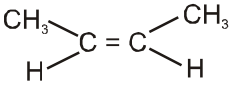
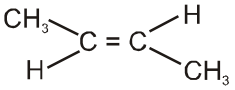
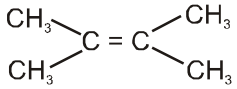
(ii) 

(iii) $CH_3 - MgBr + HCN$

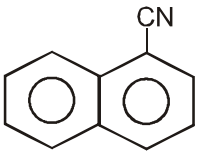
(iv) 

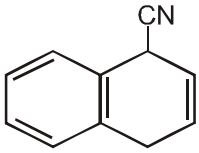
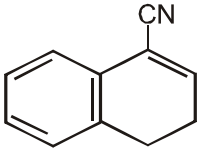
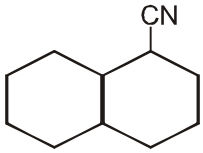
(1) (i), (ii) & (iii) (2) (i), (ii), (iii) & (iv) (3) (iii) & (iv) (4) (iii) & (i), (iv)

5. The reactivity order towards hydrogenation of the following compounds is

(I) $CH_3–C\equiv C–CH_3$ (II)  (III)  (IV) 

(1) I > II > III > IV (2) II > III > IV > I (3) III > IV > II > I (4) IV > III > II > I

6.  $\xrightarrow{Na/NH_3(\ell)}$ P, the product can be :

(1)  (2)  (3)  (4) None

7. The product of following reaction is

$$PhCH=CHCH=O \xrightarrow[(ii)\ H_3O^{\oplus}]{(i)\ LiAlH_4}$$

(1) $PhCH_2CH=CHCH_2OH$ (2) $Ph(OH)C=CHCH_3$

(3) $PhCH=CHCH_2OH$ (4) $PhCH_2CH_2CH_2–OH$

8. The product of the reaction $Ph_2C=O \xrightarrow[H_3O^{\oplus}]{LiAlD_4}$ is

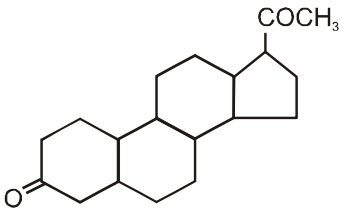
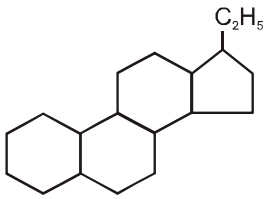
(1) $Ph_2CD(OH)$ (2) $Ph_2CH(OD)$ (3) $Ph_2CD(OD)$ (4) None

9. Hydrogenation of benzoyl chloride in the presence of Pd / $BaSO_4$ gives

(1) benzyl alcohol (2) benzaldehyde (3) benzoic acid (4) phenol

10. Which of the following reagent not convert carbonyl compound into alcohol ?

(1) DiBAL—H (2) NH_2—NH_2/KOH (3) Na—Hg/HCl (4) $LiAlH_4$

11.  $\xrightarrow{X}$  , X can be

(1) $NH_2 – NH_2$/ KOH (2) Zn – Hg/ HCl (3) Red P + HI (4) All

12. An alkene on ozonolysis yields only ethanal. There is a structure isomer of this, which on ozonolysis yields :

(1) Propanone and methanal (2) Propanone and ethanal

(3) Ethanal and methanal (4) Only propanone

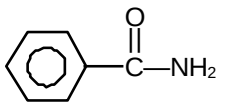
13. Which of the following will decolorise alkaline $KMnO_4$ solution ?

(1) C_3H_8 (2) CH_4 (3) CCl_4 (4) C_2H_4

14. Bayer's reagent is :

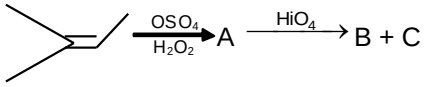
(1) alkaline permanganate solution (2) acidified permanganate solution

(3) neutral permanganate solution (4) aqueous bromine solution

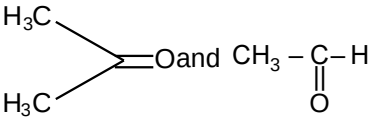
15. (P)  $\xrightarrow{H_3O^{\oplus}}$ (A) + E(gas) $\xrightarrow[2.H_2O]{1.\ LiAlH_4}$ (B) $\xrightarrow{KMnO_4/H^{\oplus}}$ (C)

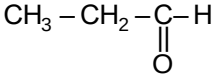
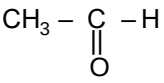
Select correct options, for identical pairs

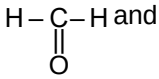
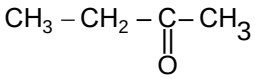
(1) P, A (2) A, C (3) B, C (4) P, C

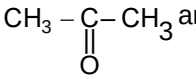
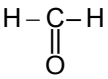
16. 

Product B and C are respectively :

(1)  and

(2)  and 

(3)  and 

(4)  and 

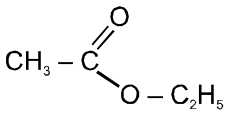
17. Fenton's reagent is :

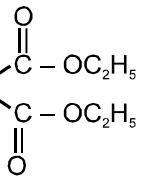
(1) $FeSO_4 + H_2O_2$ (2) $HgSO_4 + H_2O_2$ (3) $FeSO_4 + H_2O$ (4) None of these

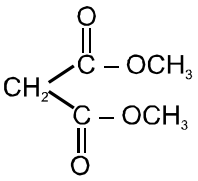
18. The reagent with which both acetaldehyde and acetone react easily is

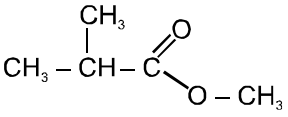
(1) Tollen's reagent (2) Schiff's reagent (3) Grignard reagent (4) Fehling reagent

19. An organic compound (P) with molecular formula $C_5H_8O_4$ is stable to heat but hydrolyse to (Q) and MeOH by NaOH followed by acidification. (Q) on strong heating gives (R) which with Red P/HI gives ethane. Compound (P) is :

(1) 

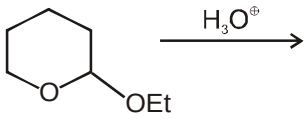
(2) 

(3) 

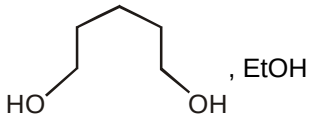
(4) 

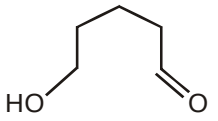
20. When acetaldehyde is treated with Fehling's solution, it gives a precipitate of

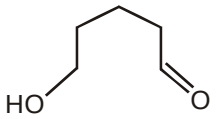
(1) Cu (2) CuO (3) Cu_2O (4) $Cu + Cu_2O + CuO$

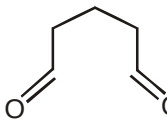
21. 

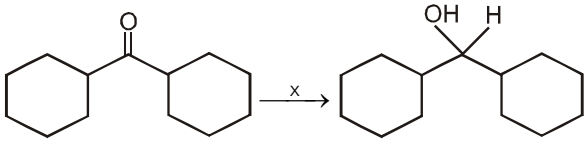
Product of above reaction is :

(1)  , EtOH

(2)  , EtOH

(3)  , CH_3OH

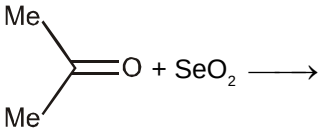
(4)  + EtOH

22. 

X is :

(1) $NaBH_4$/EtOH (2) $LiAlH_4$/THF

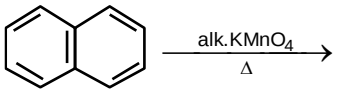
(3) $Al(OiPr)_3 / CH_3–\underset{\underset{OH}{|}}{CH}–CH_3$ (4) All of these

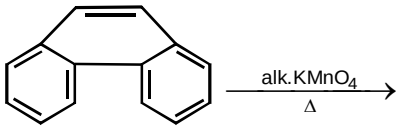
23.  (P). (P) will not :

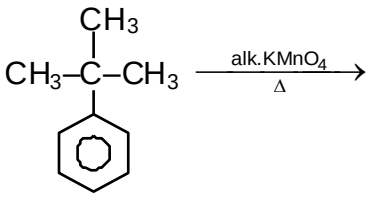
(1) reduce Tollens reagent. (2) give Iodoform test.

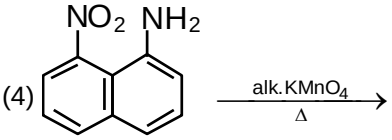
(3) form dioxime (4) give cerric ammonium nitrate test.

24. In which of the following oxidation reaction is not possible ?

(1) 

(2) 

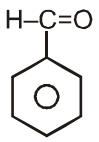
(3) 

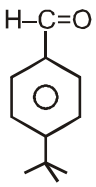
(4) 

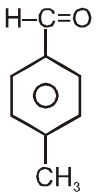
25. When 184 gm ethanol react with excess of CH_3MgCl then methane gas is evolved. Caculate mass of methane gas :

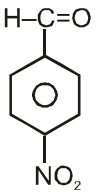
(1)16 (2) 32 (3) 64 (4) 92

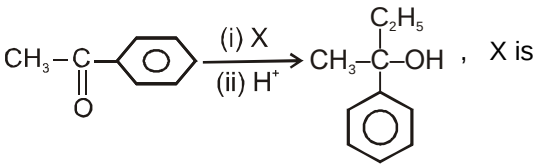
26. Which of the following compound has maximum rate of reaction with CH_3MgBr :

(1) 

(2) 

(3) 

(4) 

27.  , X is

(1) CH_3MgBr (2) $CH_3–CH_2–MgBr$ (3) C_6H_5MgBr (4) $CH_3–\underset{\underset{CH_3}{|}}{CH}–MgBr$

28. Compound $CH_3 – CH_2 – \underset{\underset{Ph – CH – OH}{|}}{CH} – CH_3$ can be prepared by

(1) $CH_3 – \underset{\underset{CH_3}{|}}{CH} – CH_2 – CHO \xrightarrow[(ii)\ H_3O^{\oplus}]{(i)\ PhMgBr}$

(2) $CH_3 – \underset{\underset{MgBr}{|}}{CH} – CH_3 \xrightarrow[(ii)\ H_3O^{\oplus}]{(i)\ PhCH_2CHO}$

(3) $Ph - COCH_3 \xrightarrow[(ii)\ H_3O^{\oplus}]{(i)\ CH_3CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - MgBr}$

(4) $PhCHO \xrightarrow[(ii)\ H_3O^{\oplus}]{(i)\ CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - MgBr}$

29. Match List I (Reaction) with List II (Product) and select the correct answer using the code given below the lists :

List I

(P) $CH_3-CH_2-CHO + CH_3MgCl \xrightarrow{H_2O}$

(Q) $CH_3-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3 + CH_3MgCl \xrightarrow{H_2O}$

(R) $CH_3-CH_2-CH_2-CHO + LiAlH_4 \xrightarrow{H_2O}$

(S) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CHO + NaBH_4 \xrightarrow{H_2O}$

List II

(1) $CH_3-CH_2-CH_2-CH_2-OH$

(2) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-CH_3$

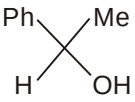
(3) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-OH$

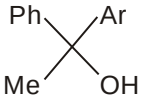
(4) $CH_3-\underset{\displaystyle OH}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-CH_3$

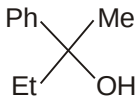
Codes :

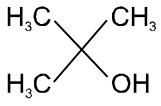
	P	Q	R	S		P	Q	R	S
(1)	4	2	1	3	(2)	3	2	4	1
(3)	2	4	1	3	(4)	1	4	2	3

30. Phenyl acetate $\xrightarrow[(ii)\ H^{\oplus}]{(i)\ CH_3MgBr\ (excess)}$ 'P', 'P' can be

(1) 

(2) 

(3) 

(4) 

31. An alkyne C_7H_{12} when reacted with alkaline $KMnO_4$ followed by acidification by HCl, yielded a mixture of $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-COOH$ & CH_3CH_2COOH. The alkyne is -

(1) 3-hexyne (2) 2-methyl-2-hexyne (3) 2-methyl-3-hexyne (4) 3-methyl-2-hexyne

32. $\underset{\displaystyle CH_2OH}{\overset{\displaystyle CHO}{\underset{|}{\overset{|}{(CHOH)_4}}}} \xrightarrow{5\ HIO_4}$ Product, product are

(1) 5 HCOOH, HCHO (2) 5HCHO, HCOOH

(3) 4 HCOOH, 2HCHO (4) 3 HCOOH, 3 HCHO

33. Which of the following on oxidation gives ethyl methyl ketone :

(1) 2-propanol (2) 1-butanol (3) 2-butanol (4) t-butyl alcohol

34. A compound C_5H_8 which give white ppt. with ammonical $AgNO_3$. A give $(CH_3)_2CHCOOH$ with hot alkaline $KMnO_4$ then compound is :

(1) $CH_3CH_2-CH_2-CH=CH_2$ (2) $CH_3-CH_2-C\equiv CH$

(3) $(CH_3)_2CH-C\equiv CH$ (4) $CH_2=CH-CH_2-CH=CH_2$

35. In Clemmensen's reduction, acetone gives :

(1) Propane (2) Propene (3) Propanol (4) Propyne

36. Compound 'X' (C_3H_8O) on oxidation with $K_2Cr_2O_7$ gives compound 'Y' (C_3H_6O). What is compound 'X' ?
(1) 1° alcohol (2) 2° alcohol (3) 3° alcohol (4) None of these

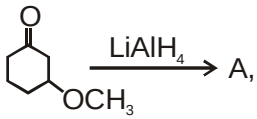
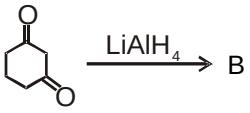
37. An alkyl halide by formation of its Grignard reagent and heating with water yields propane, What is the original alkyl halide ?
(1) Methyl iodide (2) Ethyl iodide (3) Ethyl bromide (4) Propyl bromide

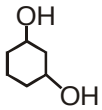
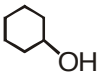
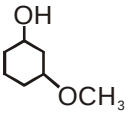
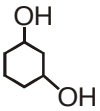
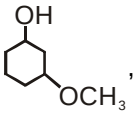
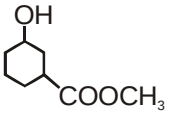
38. Which of the following reagents converts both acetaldehyde and acetone to alkanes ?
(1) Ni/H_2 (2) $LiAlH_4$ (3) $I_2/NaOH$ (4) Zn–Hg/conc.HCl

39. When CH_2== CH–COOH is reduced with $LiAlH_4$, the compound obtained will be
(1) $CH_3–CH_2–COOH$ (2) CH_2== $CH–CH_2OH$ (3) $CH_3–CH_2–CH_2OH$ (4) $CH_3–CH_2–CHO$

40. Reactivity order for the following compounds with CH_3MgBr is :
(i) CH_3CH_2COOH (ii) CH_3CH_2COCl (iii) CH_3COOCH_3 (iv) $CH_3CH_2CH_2Br$
(1) i > ii > iii > iv (2) i > ii > iv > iii (3) iv > ii > i > iii (4) ii > iv > i > iii

41. Carboxylic acids are formed by the reaction of Grignard reagent with
(1) Carbon monooxide (2) Carbon dioxide (3) Ester (4) Formaldehyde

42. (i)  A, (ii)  B

A & B are respectively :
(1) Both 
(2) Both 
(3) A is  , B is 
(4) A is  , B is 

43. In the follwoing reaction reagent Z can be
Pent-4-en-2-one $\xrightarrow{\text{Reagent-Z}}$ Pentan-2-ol
(1) $NaBH_4$, EtOH (2) $LiAlH_4$, ether (3) H_2, Pd (4) Na–Hg

44. In which reaction correct product is given ?
(1) $CH_3–C\equiv N \xrightarrow{DIBAL–H} CH_3–CH_2–NH_2$ (2) $CH_3–CH_2–NO_2 \xrightarrow{LiAlH_4} CH_3–CH_3$
(3) $Ph–CH=O \xrightarrow[KOH,\Delta]{NH_2–NH_2} Ph–CH_3$ (4) $CH_3–C\equiv C–CH_3 \xrightarrow[NH_3,(\ell)]{Na}$ Cis-but-2-ene

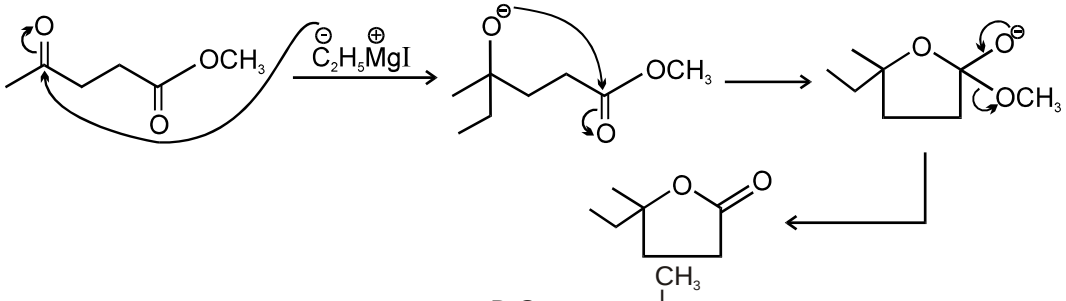
45. Which carbonyl compound (s) can be used to produce **2-phenyl butan-2-ol** on reaction with a suitable grignard reagent ?
(1) $CH_3–CO–CH_2–CH_3$ (2) $Ph–CO–CH_3$
(3) $Ph–CO–CH_2–CH_3$ (4) All of these

SPP Answers

1.	(3)	**2.**	(3)	**3.**	(4)	**4.**	(2)	**5.**	(1)	**6.**	(1)	**7.**	(4)
8.	(1)	**9.**	(2)	**10.**	(2)	**11.**	(4)	**12.**	(1)	**13.**	(4)	**14.**	(1)
15.	(2)	**16.**	(1)	**17.**	(1)	**18.**	(3)	**19.**	(3)	**20.**	(3)	**21.**	(2)
22.	(4)	**23.**	(4)	**24.**	(3)	**25.**	(3)	**26.**	(4)	**27.**	(2)	**28.**	(4)
29.	(3)	**30.**	(4)	**31.**	(3)	**32.**	(1)	**33.**	(3)	**34.**	(3)	**35.**	(1)
36.	(2)	**37.**	(4)	**38.**	(4)	**39.**	(2)	**40.**	(1)	**41.**	(2)	**42.**	(3)
43.	(3)	**44.**	(3)	**45.**	(4)								

SPP Solutions

1.



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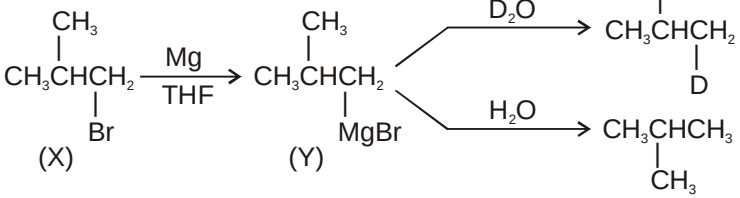
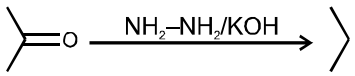


4. All of these reaction give CH_4.

5. Rate of hydrogenation will decreases on increasing steric hinderance at π bond.

6. It is birch reduction

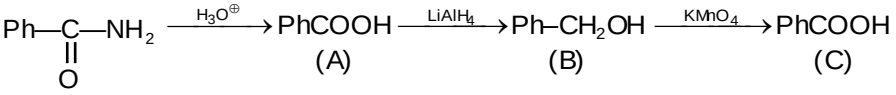
10. Wolf-kishwner reduction (NH_2—NH_2/KOH) give alkane after reduction of carbonyl compound.



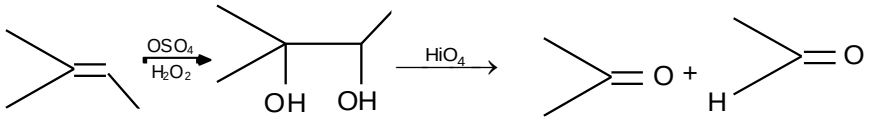
11. All reagents are used to convert >C = O to $>CH_2$

12. Alkene $\xrightarrow[(2)\ Zn+H_2O]{(1)\ O_3}$ CH_3CHO only

15.



16.



Syn addition

19. (P) on hydrolysis gives propanedioic acid and methanol. Propanedioic acid on strong heating gives acetic acid which when reduced with Red P/HI gives ethane.

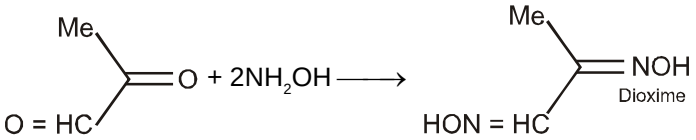
22. X can be $NaBH_4$/EtOH or $LiAlH_4$/THF or $Al(OiPr)_3 / CH_3–\underset{\displaystyle OH}{\underset{|}{CH}}–CH_3$

23. $Me – \overset{\displaystyle O}{\overset{\|}{C}} – Me \xrightarrow{SeO_2} OHC – \overset{\displaystyle O}{\overset{\|}{C}} – Me$

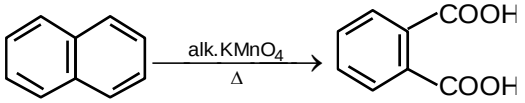
In (1), (P) reduces Tollens reagent, since it contains (–CHO) group.

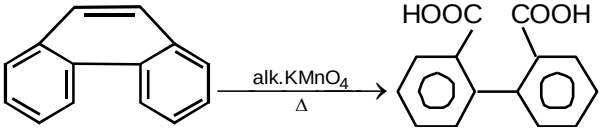
In (2), (P) gives iodoform test, since it contains (MeCO–) group.

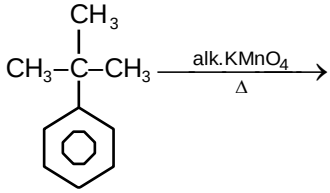
In (3), (P) forms dioxime, since it contains (–CHO) and $\left(\begin{array}{c}\diagdown\\ C=O\\ \diagup\end{array}\right)$ groups.



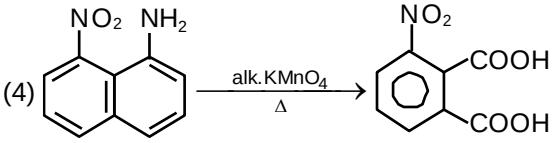
In (4), (P) does not gives cerric ammonium nitrate test, since this test is given by alcohols and (P) does not contain an alcoholic group. So the answer is (4).

24. (1) 

(2) 

(3) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{C}}–CH_3$ 

no reaction

(4) 

31. $CH_3 – \underset{\displaystyle CH_3}{\underset{|}{CH}} – \boxed{COOH} + HOOC – CH_2 – CH_3 \longrightarrow CH_3 – \underset{\displaystyle CH_3}{\underset{|}{CH}} – C \equiv C – CH_2 – CH_3$

32. $\underset{\displaystyle CH_2OH}{\underset{|}{\overset{\displaystyle CHO}{\overset{|}{(CHOH)_4}}}} \xrightarrow{5\ HIO_4}$ 5 HCOOH, HCHO