



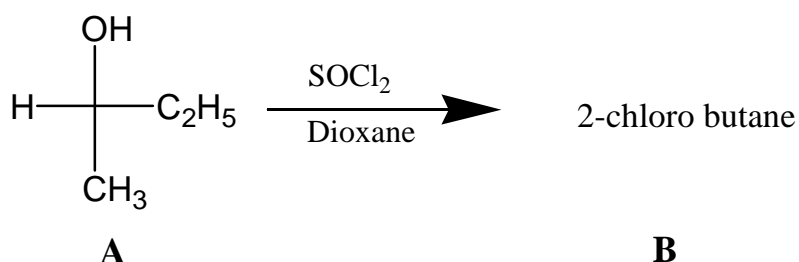
**Q.5.** In the conversion of a Grignard reagent into an aldehyde, the other components used are

- (1)  $\text{HCOOC}_2\text{H}_5$  (2)  $\text{CH}_3\text{COOC}_2\text{H}_5$   
(3)  $\text{CO}_2$  (4)  $\text{HCN}$

**Codes:**

- (a) 1, 3 and 4 (b) 1 and 4  
(c) 1 and 2 (d) 2 and 4

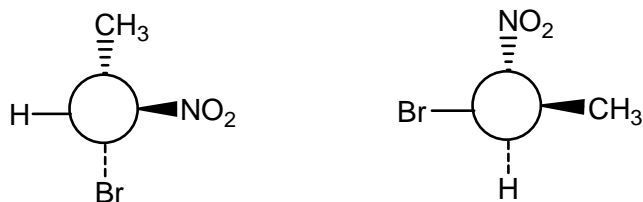
**Q. 6:** An optically active alcohol (**A**) reacts with  $\text{SOCl}_2$  to form product (**B**) as shown:



In this regard, which one of the following statements is true?

- (a) A and B are both *R*-isomer. (b) A and B are both *S*-isomer.  
(c) A is *R*-isomer and B is *S*-isomer (d) A is *S*-isomer and B is *R*-isomer

**Q.7:** The following structures, Represents a pair of



- (a) Enantiomers (b) Diastereomers  
(c) Meso compounds (d) One and the same compound

**Q.8:** Match List I with List II and select the correct answer using the codes given below the lists:

**List I**

- A.  $\alpha$ -D-Glucose &  $\beta$ -D-Glucose  
B. D-Glucose & D-Mannose  
C. Erythrose & threose  
D. D (+) Glycerinaldehyde & L(-) Glycerinaldehyde

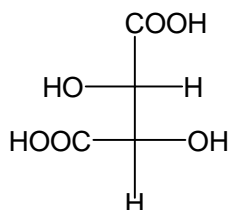
**List II**

1. Enantiomers  
2. Anomers  
3. Epimers  
4. Diastereomers

**Codes:**

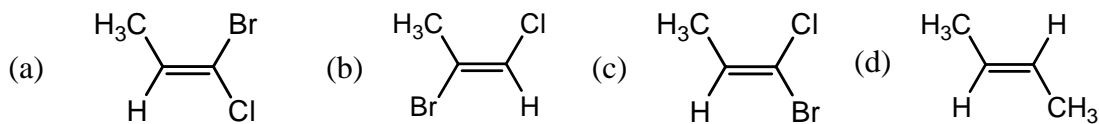
	A	B	C	D
(a)	3	2	1	4
(b)	2	3	4	1
(c)	3	2	4	1
(d)	2	3	1	4

**Q.9:** The structural representation of Tartaric acid as shown has

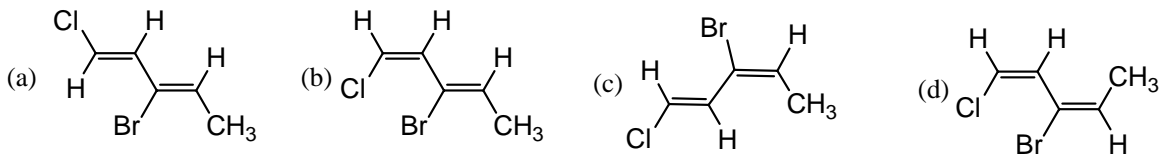


- (a) a plane of symmetry                      (b) a center of symmetry  
 (c) Both plane and point of symmetry      (d) Neither plane nor point of symmetry

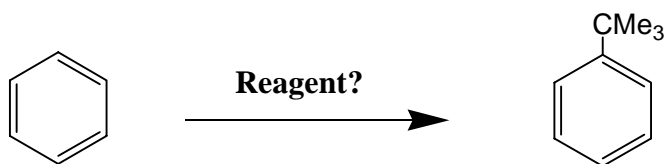
**Q. 10:** Which one of the following is a Z-isomer?

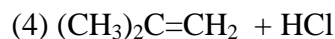
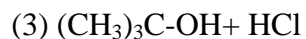
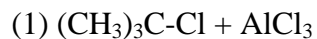


**Q. 11:** Which one of the following has 1*E*, 3*Z*-configuration?



**Q.12:** In the conversion of Benzene into tert-butyl benzene, the reagent used are:





**Codes:**

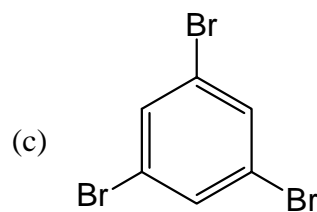
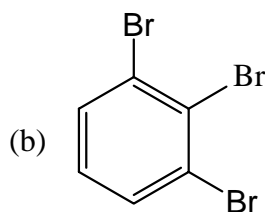
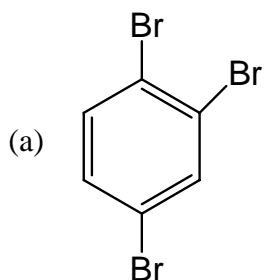
(a) 1 only

(b) 1,3 and 4

(c) 1, 2 and 3

(d) All of the above

**Q. 13:** A tribromobenzene (A) forms three mononitro tribromobenzenes. The structure of 'A' is



(d) None of the above.

**Q. 14:** Phenol can be converted into Salicylic acid using

(a)  $\text{CO}_2$  and alkali under pressure

(b)  $\text{CCl}_4$  in alkali

(c)  $\text{CHCl}_3$  in alkali followed by oxidation

(d) All of the above

**Q.15:** Match List I with List II and select the correct answer using the codes given below :

**List I**

A. Grignard reaction

B. Wilkinson Catalyst

C. Reformatsky reaction

D. Wittig reaction

**List II**

1. Zn

2. Mg

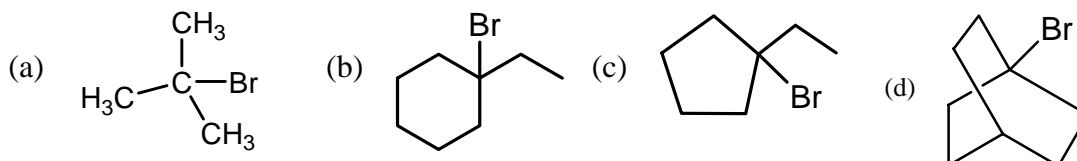
3.  $\text{PPh}_3=\text{CH}_2$

4. Rh

**Codes:**

	A	B	C	D
(a)	1	2	3	4
(b)	2	3	4	1
(c)	2	4	1	3
(d)	2	3	1	4

**Q. 16:** Which of the following compounds will undergo slowest nucleophilic substitution?



**Q.17:** When  $C_6H_5CH_2Cl$  is treated with ethanolic KCN, large amount of  $C_6H_5CH_2OC_2H_5$  is produced along with  $C_6H_5CH_2CN$ . Therefore, the most likely mechanism for this reaction will be

- (a)  $S_N2$  Mechanism (b)  $S_Ni$  Mechanism  
(c)  $S_N1$  Mechanism (d) Both  $S_N1$  and  $S_N2$  Mechanism

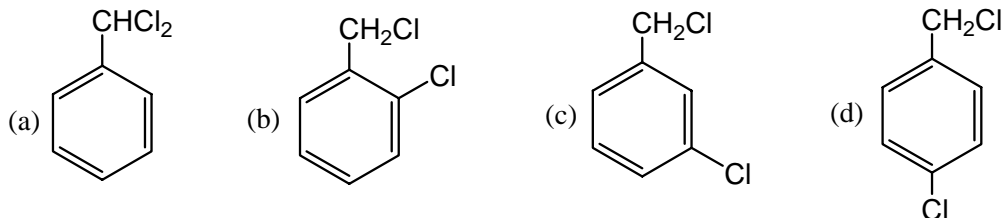
**Q.18:** The mechanism of formation of  $C_6H_5NH_2$  by the action of  $NaNH_2$ -liq  $NH_3$  on  $C_6H_5Cl$  is an example of

- (a) Nucleophilic substitution (b) Electrophilic substitution  
(c) Addition followed by elimination (d) Elimination followed by addition

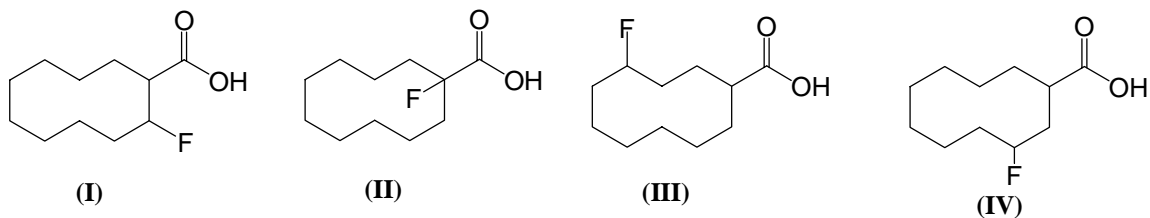
**Q.19:** Which one of the following compounds does not form alcohol on treatment with aq. KOH:

- (a) 1-chloroethene (b) 1-chloropropane  
(c) 2-chloropropane (d) 2,2-dimethyl-1-chloropropane

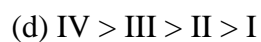
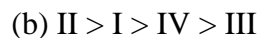
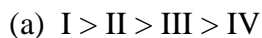
**Q.20:** An aromatic compound 'A'  $C_7H_6Cl_2$ , gives AgCl on boiling with alcoholic  $AgNO_3$  sol<sup>n</sup> and yields  $C_7H_7OCl$  on treatment with NaOH. 'A' on oxidation gives a monochlorobenzoic acid, which affords only one mononitro derivative. The compound 'A' is



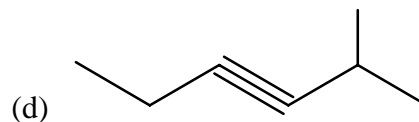
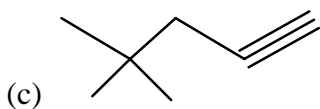
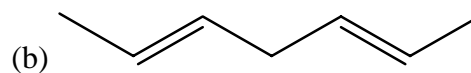
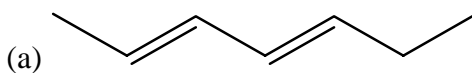
**Q.21:** Among the following given compounds



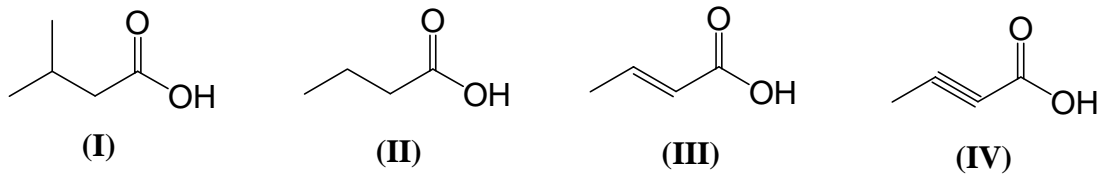
The decreasing order of their acidity is:



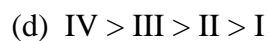
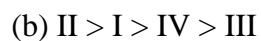
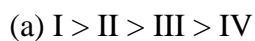
**Q.22:** A hydrocarbon ( $C_7H_{12}$ ), on catalytic hydrogenation over platinum gives  $C_7H_{16}$ . The parent hydrocarbon adds  $Br_2$  and also reacts with  $[Ag(NH_3)_2]OH$  to give a precipitate. The parent hydrocarbon is



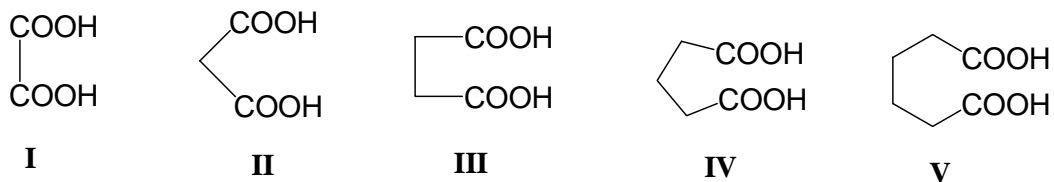
**Q.23:** Among the following given compounds



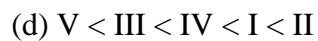
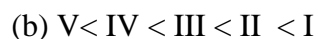
The decreasing order of their acidity is:



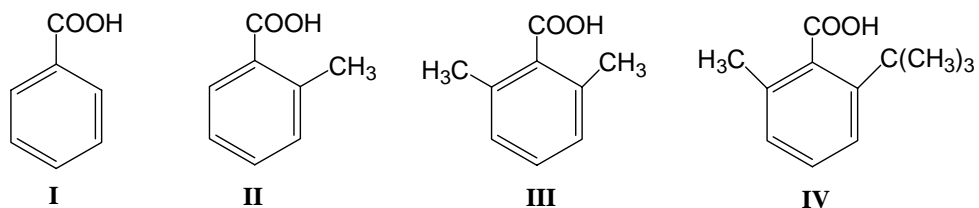
**Q.24:** Among the following given compounds



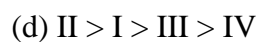
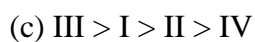
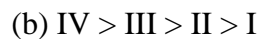
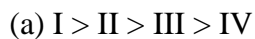
The increasing order of their acidity is:



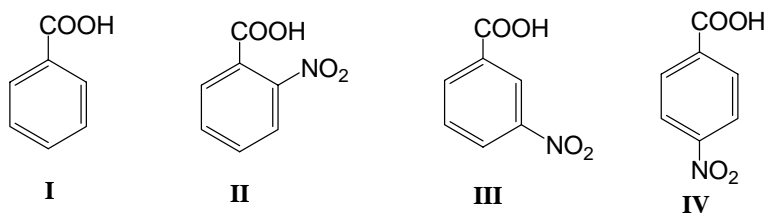
**Q.25:** Among the following given compounds



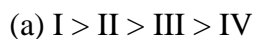
The decreasing order of their acidity is:



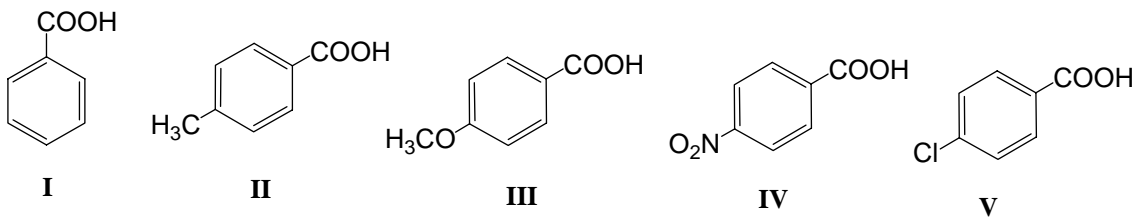
**Q.26:** Among the following given compounds



The decreasing order of their acidity is:



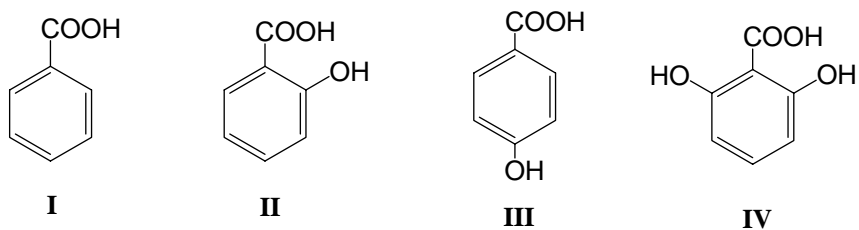
**Q.27:** Among the following given compounds,



The decreasing order of their acidity is:

- (a) IV > V > I > III > II                      (b) IV > V > I > II > III  
(c) V > IV > I > II > III                      (d) V > IV > I > III > II

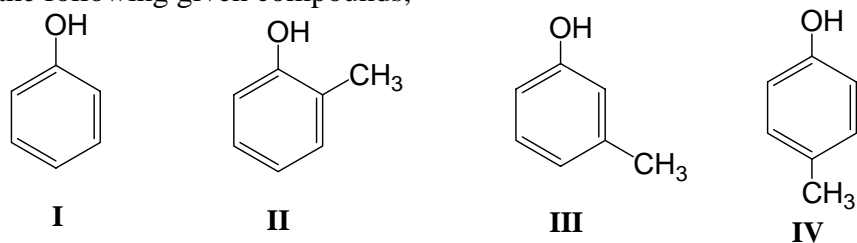
**Q.28:** Among the following given compounds,



The decreasing order of their acidity is:

- (a) I > II > III > IV                      (b) I > III > II > IV  
(c) IV > II > III > I                      (d) IV > II > I > III

**Q.29:** Among the following given compounds,

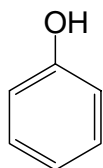


The decreasing order of their acidity is:

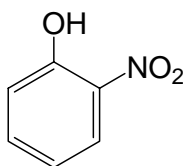
- (a) I > II > III > IV                      (b) I > III > II > IV  
(c) I > III > IV > II                      (d) II > I > III > IV



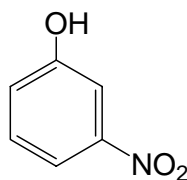
**Q.30:** Among the following given compounds,



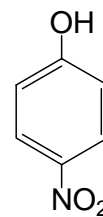
**I**



**II**

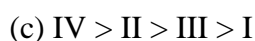
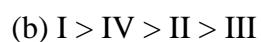


**III**

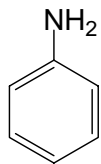


**IV**

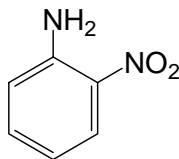
The decreasing order of their acidity is:



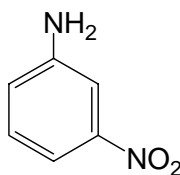
**Q.31:** Among the following given compounds



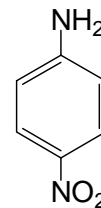
**I**



**II**

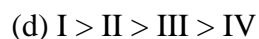
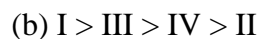


**III**

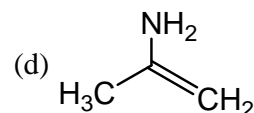
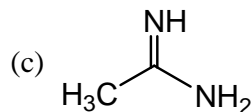
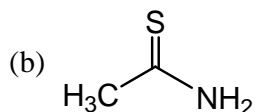
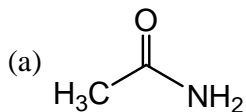


**IV**

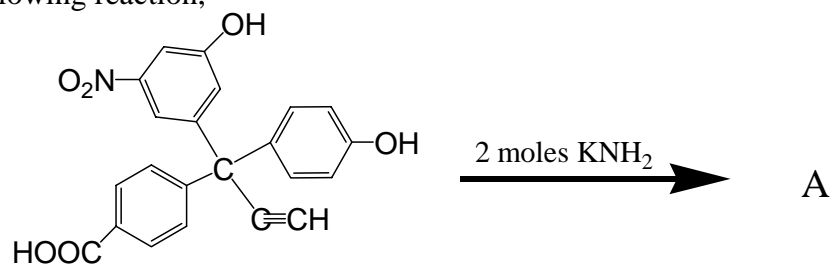
The decreasing order of their basicity is:



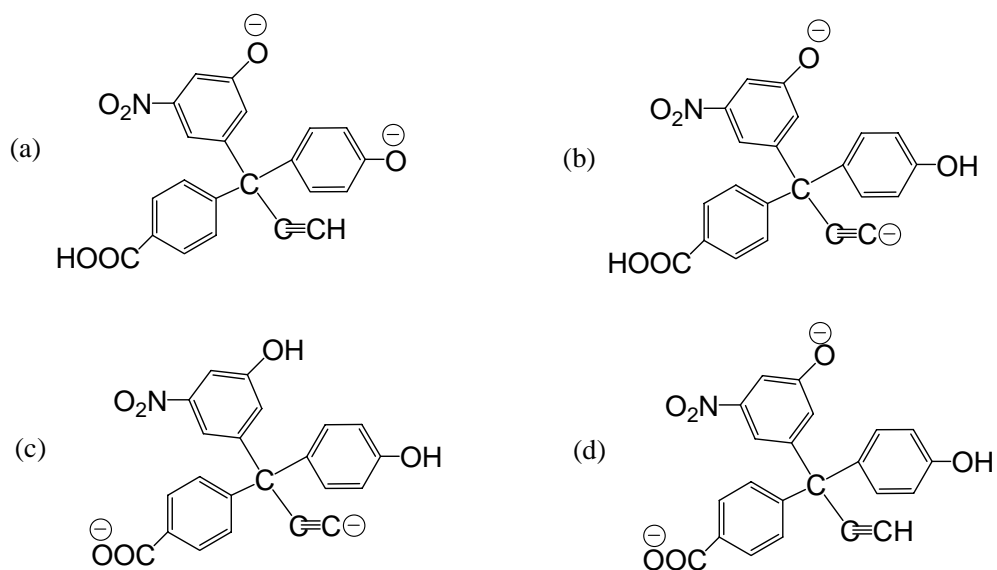
**Q.32:** Which one of the following compounds is the most basic in aqueous medium?



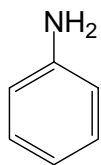
**Q.33:** In the following reaction,



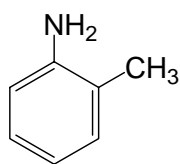
The product A will be



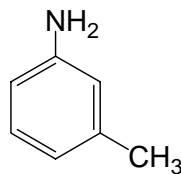
**Q.34:** Among the following given compounds



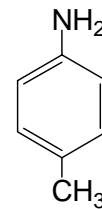
**I**



**II**



**III**



**IV**

The decreasing order of their basicity is:

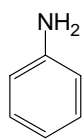
(a) I > II > III > IV

(b) II > III > IV > I

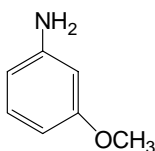
(c) II > IV > III > I

(d) IV > III > I > II

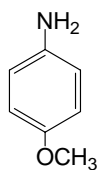
**Q.35:** Among the following given compounds,



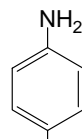
I



II



III



IV

The decreasing order of their basicity is:

(a) I > II > III > IV

(b) II > I > III > IV

(c) III > I > II > IV

(d) IV > I > III > II

**Q.36:** Which one of the following compounds will react with two moles of  $\text{CH}_3\text{MgBr}$ ?

(a)  $\text{CH}_3\text{COOH}$

(b)  $\text{H}_3\text{C}-\text{C}\equiv\text{C}-\text{CH}_3$

(c)  $\text{H}_3\text{C}-\text{CH}_2\text{CH}_2\text{OH}$

(d)  $\text{HC}\equiv\text{C}-\text{CH}_2\text{OH}$

**Q.37:** Match List I with List II and select the correct answer using the codes given below

**List I**

- A. Diastereomers
- B. Meso compound
- C. Conformers
- D. Racemic mixture
- E. Enantiomers

**List II**

- 1. Internal compensation
- 2. External compensation
- 3. Different reaction under chiral medium
- 4. Results by the free rotation about C-C bond
- 5. Cis –Trans isomerism

**Codes:**

	A	B	C	D	E
(a)	5	2	4	1	3
(b)	3	1	4	2	5
(c)	3	2	5	5	4
(d)	5	1	4	2	3

**Q.38:** Match List I with List II and select the correct answer using the codes given below

**List I**

A. Bayer villiger oxidation

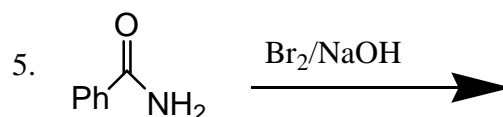
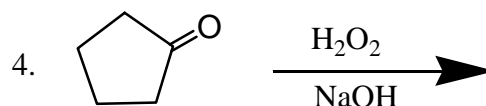
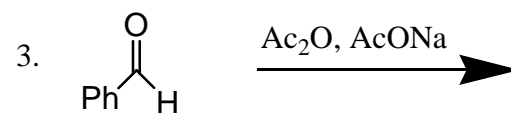
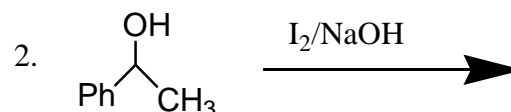
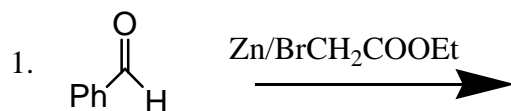
B. Haloform reaction

C. Reformatsky reaction

D. Hoffman rearrangement

E. Perkin reaction

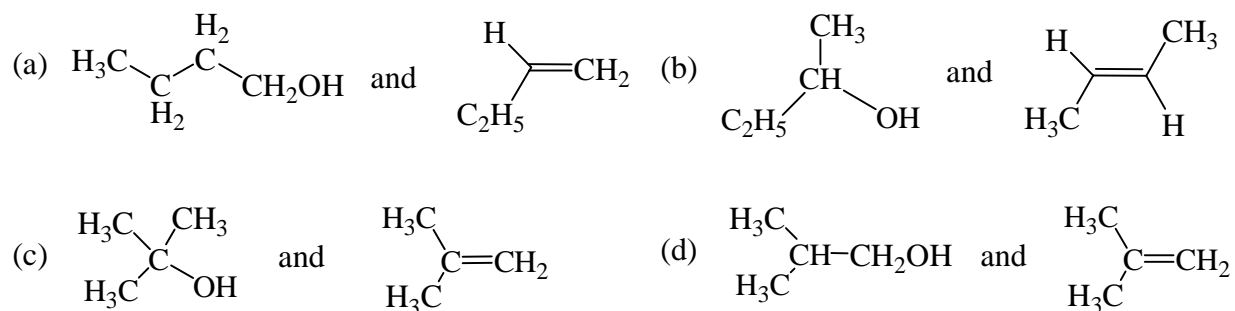
**List II**



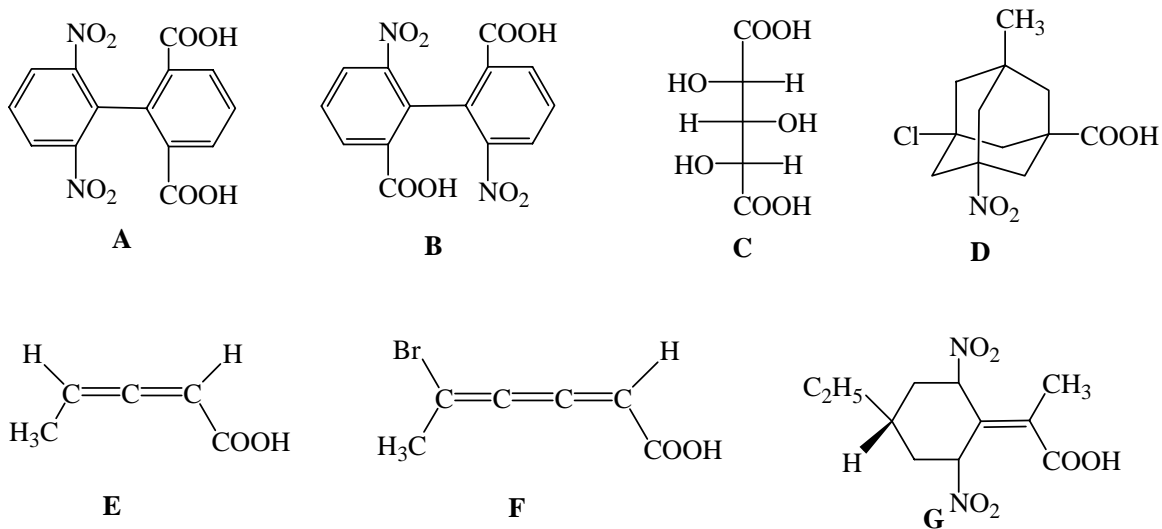
**Codes:**

	A	B	C	D	E
(a)	5	2	1	4	3
(b)	4	2	1	5	3
(c)	2	3	4	5	1
(d)	2	3	4	5	1

**Q.39:** An alcohol 'A' on dehydration gives 'B' which on ozonolysis gives acetone and formaldehyde. 'B' decolorizes  $\text{KMnO}_4$  solution but 'A' does not. Hence 'A' and 'B' are respectively:



**Q.40:** Which of the following compounds can be obtained in an optically active form?



Select the correct answer using the codes given below:

**Codes:**

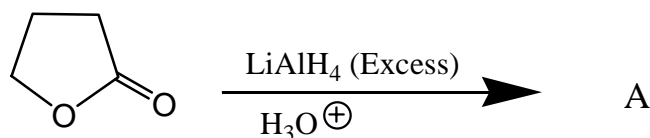
(a) B, C, D, E and G

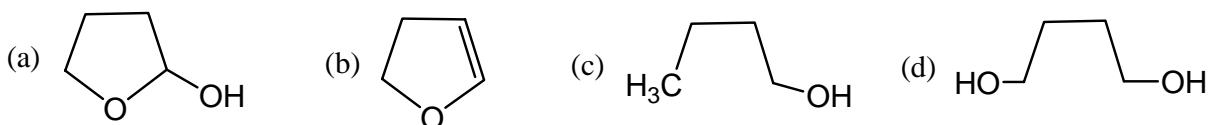
(b) D, E and G

(c) D, E, F and G

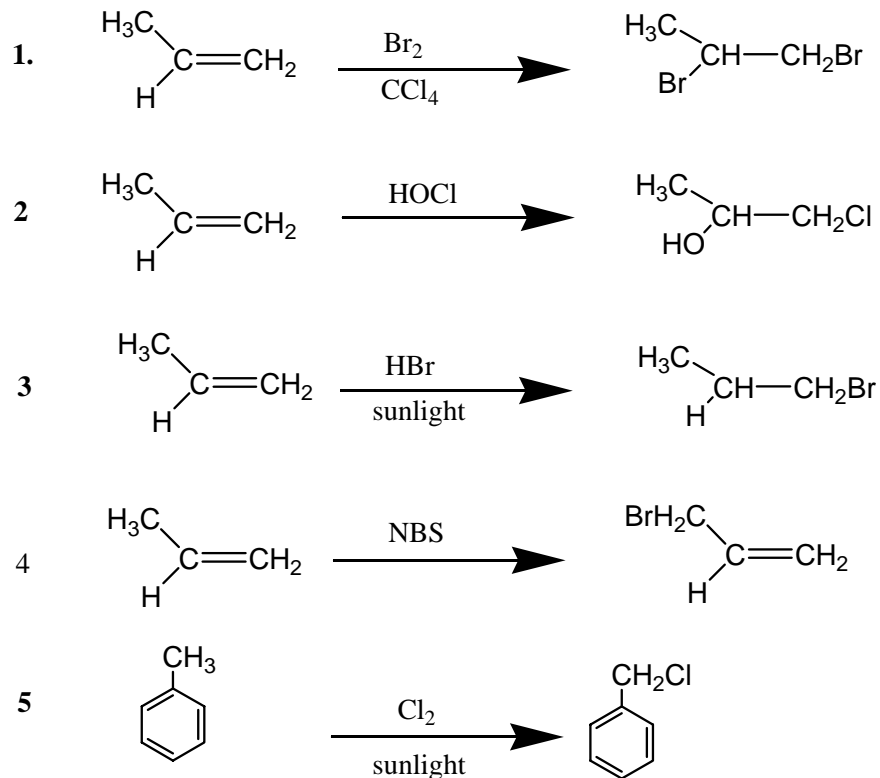
(d) B, D, E and G

**Q.41:** The major product (A) formed in the following reaction is





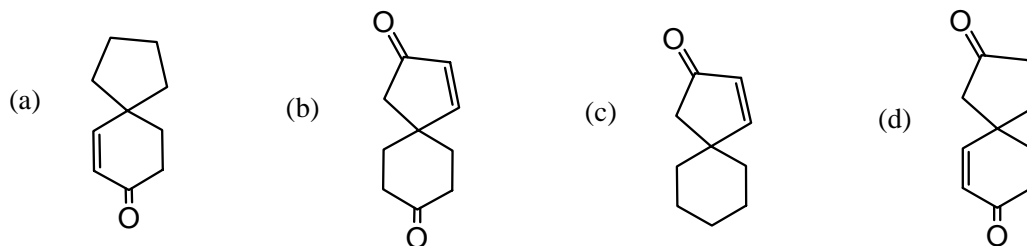
**Q.42:** Consider the following reactions,



The reactions, which proceed through free radical mechanism, are

- (a) 3 and 4  
 (b) 3, 4 and 5  
 (c) 2, 3, 4 and 5  
 (d) All of the above.

**Q.43:** The compound among the following, which can exhibit optical activity is:



**Directions:** The following two items consists of two statements: - Assertion (A) and Reason (R). You are to examine these two statements and choose the correct answer using the following

**Codes:**

- (a) Both A and R are true and R is the correct explanation of A.  
 (b) Both A and R are true, But R is not the correct explanation of A.  
 (c) A is true but R is false  
 (d) A is false but R is true.

**Q.44:** Assertion (A): Addition of Br<sub>2</sub> to 2-butene is a stereoselective reaction.

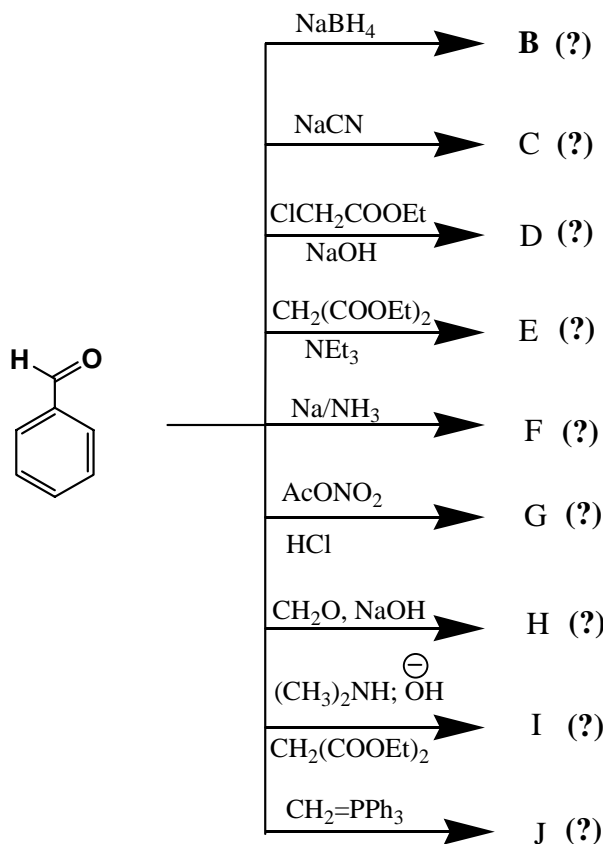
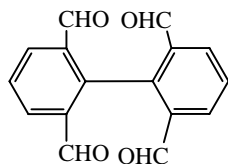
Reason (R): Addition of Br<sub>2</sub> to 2-butene is an electrophilic and is a two-step process.

**Q.45:** Assertion (A): Pyrrole is a relatively non-basic in nature.

Reason (R): In Pyrrole, Nitrogen is sp<sup>3</sup> hybridized.

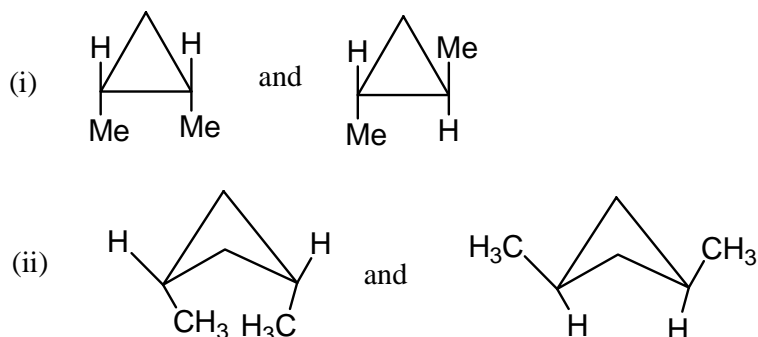
**Section B****(3 x 10 = 30)**

**Q.1:** Write down the product formed in the following organic reactions?

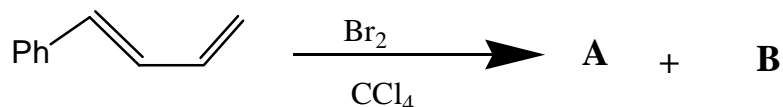
**1x 10 = 10**

**Q.2: (a)** Write and explain the most stable conformation of cis-4-tert-butyl cyclohexanol. 3

(b) Among the following cycloalkanes, which is more stable and why? 2

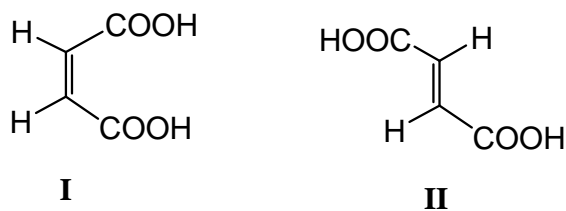


(c) In the following reaction, which will be more stable product and why? 3

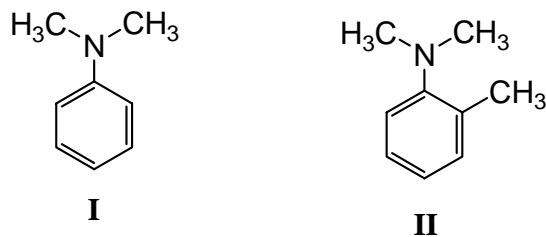


(d) Among  $\text{CH}_3\text{CH}_2\text{Cl}$  and  $\text{CH}_3\text{OCH}_2\text{Cl}$ , which will solvolysed faster? Explain 2

**Q3: (a)** Among maleic acid and fumaric acid which gives faster ionization and what about the second ionization? 2



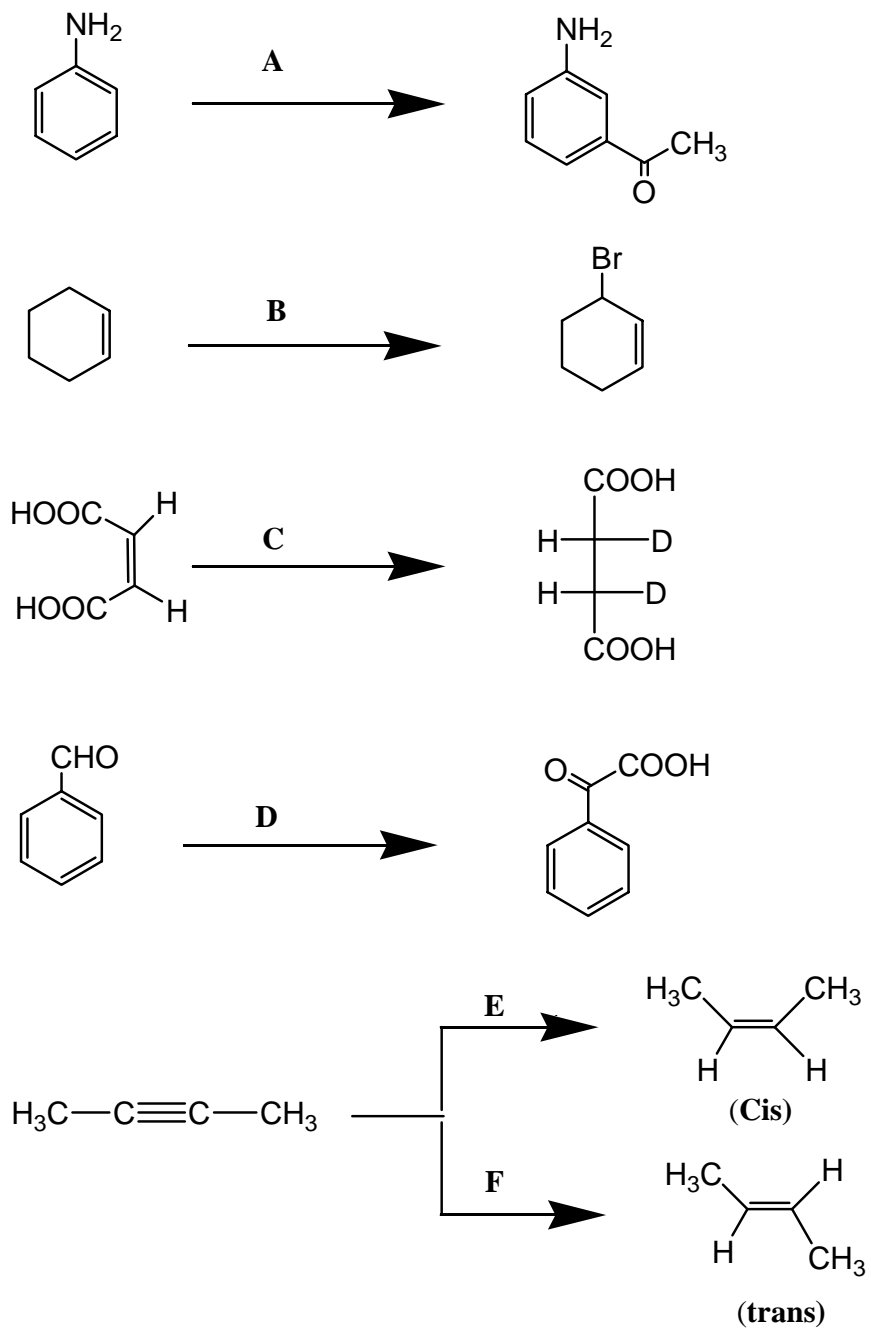
(b) Among the *N,N*-dimethyl aniline (I) and *O*-methyl-*N,N*-dimethyl aniline (II), which is more basic and why? 2





(c) Give the appropriate reagents used for the following conversion.

1 x 6 = 6



## Answer Sheet (Section A)

Q. No	Ans (code)
Q: 1	
Q: 2	
Q: 3	
Q: 4	
Q: 5	
Q: 6	
Q: 7	
Q: 8	
Q: 9	
Q: 10	
Q: 11	
Q: 12	
Q: 13	
Q: 14	
Q: 15	

Q. No	Ans (code)
Q: 16	
Q: 17	
Q: 18	
Q: 19	
Q: 20	
Q: 21	
Q: 22	
Q: 23	
Q: 24	
Q: 25	
Q: 26	
Q: 27	
Q: 28	
Q: 29	
Q: 30	

Q. No	Ans (code)
Q: 31	
Q: 32	
Q: 33	
Q: 34	
Q: 35	
Q: 36	
Q: 37	
Q: 38	
Q: 39	
Q: 40	
Q: 41	
Q: 42	
Q: 43	
Q: 44	
Q: 45	

For any clarifications, students are encourage to contact

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