Additional Problems for Self Practice (APSP)

✍ **Marked questions are recommended for Revision.**

This Section is not meant for classroom discussion. It is being given to promote self-study and self testing amongst the Resonance students.

PART - I : PRACTICE TEST-1 (IIT-JEE (MAIN Pattern))

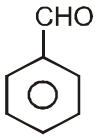
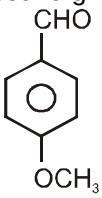
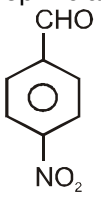
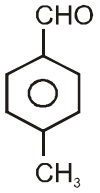
Max. Time : 1 Hr. **Max. Marks : 120**

Important Instructions

1. The test is of **1 hour** duration.
2. The Test Booklet consists of **30** questions. The maximum marks are **120.**
3. Each question is allotted **4 (four)** marks for correct response.
4. Candidates will be awarded marks as stated above in Instructions No. 3 for correct response of each question.
¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
5. There is only one correct response for each question. Filling up more than one response in any question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instructions 4 above.

1. Which solvent is non-polar solvent ?
(1) $CH_3–CO–CH_3$ (2) $CH_3–SO–CH_3$ (3) CH_3COOH (4) Cyclohexane

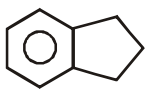
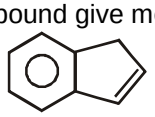
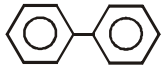
2. Which one of the following has minimum nucleophilicity ?
(1) $(CH_3)_3CLi$ (2) $NaNH_2$ (3) CH_3ONa (4) NaOH

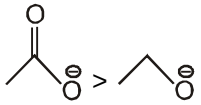
3. Which of the following compound gives fastest nucleophilic addition reaction :
(1) 
(2) 
(3) 
(4) 

4. ✍ Benzoyl chloride on treatment with ammonia gives
(1) Benzamide (2) Acetamide (3) Benzylamine (4) Benzoic acid

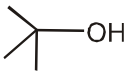
5. ✍ Which of the following is a nucleophile ?
(1) $\dot{C}H_3$ (2) $CH_2^{\bullet\bullet}$ (3) $CH_3-\ddot{N}$ (4) $CH_3-\ddot{N}H_2$

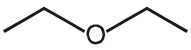
6. Which of the following reactants will give only one organic product when reacted with NaCN / H_2SO_4 (small amounts) (No other isomer is obtained)
(1) CH_3CHO (2) HCHO (3) PhCHO (4) $CH_3-\overset{\overset{O}{\|}}{C}-CH_2-CH_3$

7. ✍ Which of the following compound give methane on treatment with CH_3MgI.
(1) 
(2) 
(3) 
(4) 

8. The correct order of leaving ability is :
(1) $\overset{\ominus}{O}H > H_2O$ (2) $\overset{\ominus}{O}H > \overset{\ominus}{S}H$ (3)  (4) $\overset{\ominus}{Cl} > \overset{\ominus}{I}$

9. In which of reaction  will obtained as a product ?

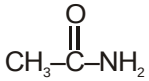
(1) PhMgBr + 

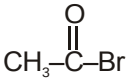
(2) PhMgBr + 

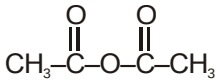
(3) PhMgBr + $CH_3–CH_2–CH_3$

(4) PhMgBr + 

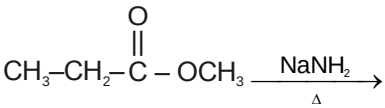
10. Which of the following is the most reactive towards nucleophilic acyl substitution ?

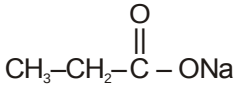
(1) 

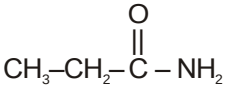
(2) 

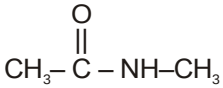
(3) 

(4) $CH_3COOC_2H_5$

11.  X, X is

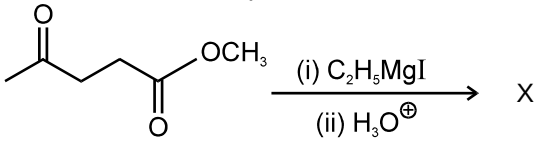
(1) 

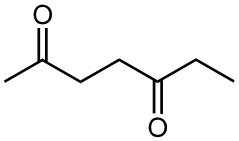
(2) 

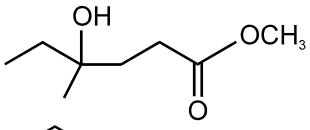
(3) 

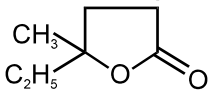
(4) $CH_3–CH_2–NH_2$

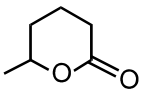
12. Give the structure of the compound X formed in the following reaction.

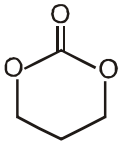


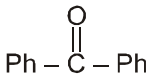
(1) 

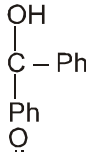
(2) 

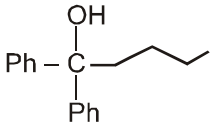
(3) 

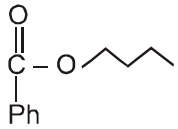
(4) 

13. PhMgBr (excess) +  $\xrightarrow{H^+}$ (A) . Product (A) is :

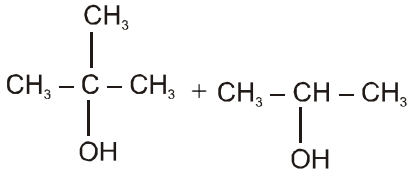
(1) 

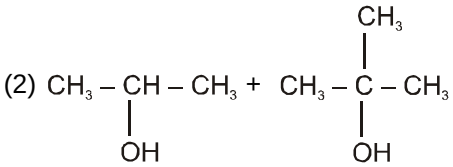
(2) 

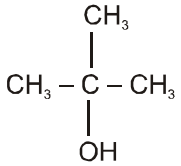
(3) 

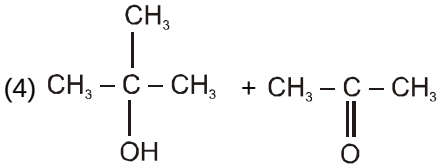
(4) 

14. 

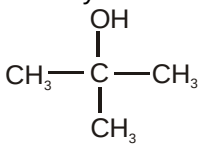
(1) 
(2mol) (1mol)

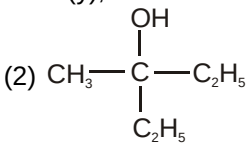
(2) 
(2mol) (1mol)

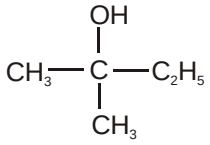
(3) 
(3mol)

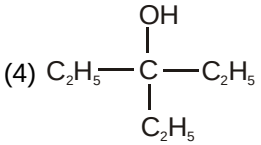
(4) 
(2mol) (1mol)

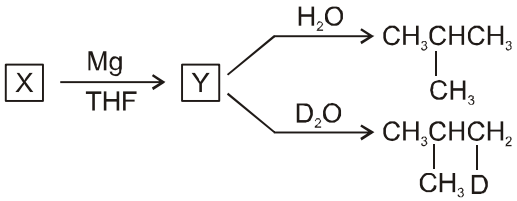
15. A sweet smelling compound(x) with molecular formula $C_8H_{16}O_2$ on reaction with excess of CH_3MgBr followed by acidification gives a single organic product(y), the structure of (y) can be :

(1) 

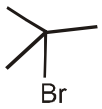
(2) 

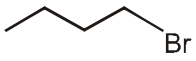
(3) 

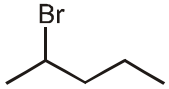
(4) 

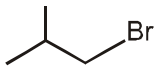
16. 

Give the structure of X.

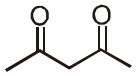
(1) 

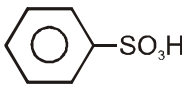
(2) 

(3) 

(4) 

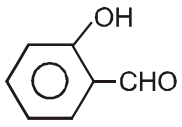
17. Which of the following compound give benzene on reaction with PhMgBr.

1. 

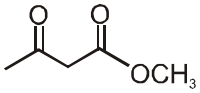
2. 

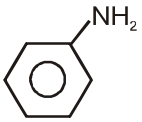
3. 

4. $CH_3–C\equiv CH$

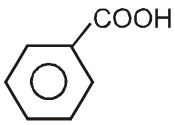
5. 

6. CH_3NH_2

7. 

8. 

9. CH_3SH

10. 

(1) 2,3,4,5 (2) 7,8,9 (3) 2,4,5,7,10 (4) All

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

(i) CH_3–MgBr + CH_3–C≡CH

(ii) CH_3 – MgBr + CH_2(COOH)(COOH)

(iii) CH_3–MgBr + HCN

(iv) CH_3 – MgBr + CH_2(C(=O)–CH_3)(C(=O)–CH_3)

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

19. Which of the following will not give 2º alcohol ?

(1) CH_3–CH_2–CHO+ CH_3–MgBr

(2) CH_3–C(=O)–CH_2CH_3 + $NaBH_4$

(3) CH_3–C(=O)–O–CH(CH_3)–CH_2–CH_3 + $LiAlH_4$

(4) CH_3–C(=O)–O–CH_2–CH_3 $\xrightarrow[Et_2O]{CH_3MgBr\,(excess)}$

20. Which of these statements is incorrect about nucleophiles ?

(1) Nucleophiles have an unshared electron pair and can make use of this to react with an electron deficient species.

(2) The nucleophilicity of an element (as electron donor) generally increases on going down a group in the periodic table.

(3) A nucleophile is electron-deficient species

(4) All good nucleophiles are good bases when we deal across the period.

21. Which of the following reaction is substitution reaction ?

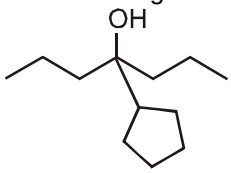
(1) CH_3–CHO $\xrightarrow[H^{\oplus}]{KCN}$ CH_3–C(H)(CN)–OH

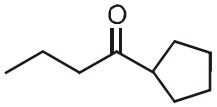
(2) CH_3–CH=CH_2 $\xrightarrow{HCl}$ CH_3–CH(Cl)–CH_3

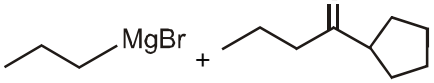
(3) CH_3–CH(Cl)–CH_3 $\xrightarrow{Alc.\ KOH}$ CH_3–CH=CH_2

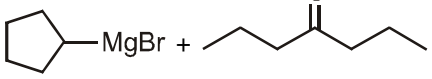
(4) CH_3–C(=O)–OH $\xrightarrow{CH_3OH}$ CH_3–C(=O)–OCH_3

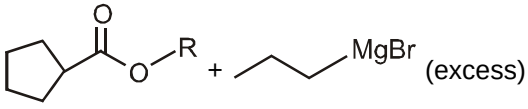
22. Which of the following combination of reactants can not be used to prepare the following compound ?



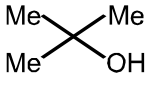
(1) CH_3MgBr (excess) + 

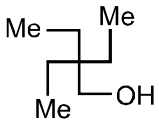
(2) 

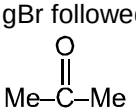
(3) 

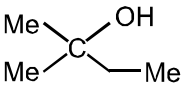
(4) 

23. When ethyl ethanoate is treated with excess of MeMgBr followed by hydrolysis, the product is :

(1) 

(2) 

(3) 

(4) 

24. What product is formed when acetic acid heated with P_2O_5.

(1) Acetyl chloride (2) Acetate ester (3) Acetic anhydride (4) Acetaldehyde

25. Which species will not be considered as an electrophile ?
(1) $CH_3 - \overset{\oplus}{C}H_2$ (2) $AlCl_3$ (3) NH_3 (4) SO_3

26. When grignard reagent is treated with isopropyl formate followed by acid hydrolysis we get :
(1) Aldehyde (2) 2º alcohol (3) 3º alcohol (4) 1º alcohol

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

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

28. Identify the correct set of aprotic solvent .
(1) Water, DMSO (2) DMSO, Acetone
(3) Ethanol, Acetone (4) Diethylether, Methyl amine

29. Acid hydrolysis of which of the following compounds yields two different organic compounds?
(1) CH_3COOH (2) CH_3CONH_2 (3) $CH_3COOC_2H_5$ (4) $(CH_3CO)_2O$

30. Leaving group ability order amongst the following
(I) $C_6H_5O^-$ (II) p-(CH_3) $C_6H_4O^-$ (III) p-$(OCH_3)C_6H_4O^-$ (IV) p-$(NO_2)C_6H_4O^-$
(1) I > II > III > IV (2) III > II > I > IV
(3) IV > I > II > III (4) IV > III > II > I

Practice Test-1 (IIT-JEE (Main Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

Que.	1	2	3	4	5	6	7	8	9	10
Ans.										
Que.	11	12	13	14	15	16	17	18	19	20
Ans.										
Que.	21	22	23	24	25	26	27	28	29	30
Ans.										

PART - II : NATIONAL STANDARD EXAMINATION IN CHEMISTRY (NSEC) STAGE-I

1. Which of the following is NOT a nucleophile ? **[NSEC-2001]**
(A) H_2 (B) CH_3OH (C) H_2O (D) NH_3

2. Which of the following compounds would react with PhMgBr subsequently yield Ph_3COH ? **[NSEC-2002]**
(A) a ketone (B) an ester other than formic
(C) diethyl carbonate (D) all of these.

3. Absolutely pure hydrogen cyanide fails to react with aldehydes because **[NSEC-2002]**
(A) hydrogen cyanide is not a strong nucleophile
(B) hydrogen cyanide is undissociated when pure
(C) hydrogen cyanide cannot add to the carbonyl group on its own
(D) all the above are correct.

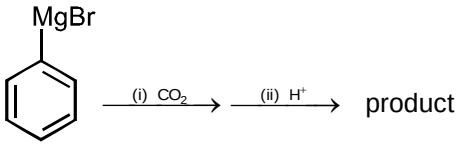
4. The group which contains a Lewis acid, a nucleophile and a radical is **[NSEC-2003]**
(A) C_2H_6, Br^+, Cl atom (B) NH_3, $AlCl_3$, H atom (C) H^+, BF_3, H_2O^+ (D) C_6H_6, CH_3^+, Cl_2.

5. The non-nucleophilic base is **[NSEC-2004]**
(A) CN^- (B) $^-OC(Me)_3$ (C) HO^- (D) MeO^-

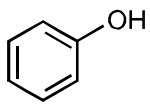
6.* The reagent with which both hexanol and 2-pentanone reacts is **[NSEC-2004]**
(A) Fehling`s solution (B) Grignard reagent (C) Schiffs reagent (D) Tollen`s reagent.

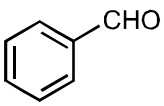
7. The relative reactivity of carbonyl compounds towards nucleophilic addition is **[NSEC-2005]**
(A) $CH_3CHO > CH_3COCH_3 > CH_3COOCH_3 > CH_3CONH_2$
(B) $CH_3COOCH_3 > CH_3CONH_2 > CH_3CHO > CH_3COCH_3$
(C) $CH_3CONH_2 > CH_3CHO > CH_3COCH_3 > CH_3COOCH_3$
(D) $CH_3CHO > CH_3COOCH_3 > CH_3CONH_2 > CH_30OCH_3$.

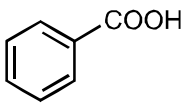
8. In the reactions $CH_3CHO + HCN \longrightarrow CH_3CH(OH)CN \xrightarrow{H-OH} CH_3CH(OH)COOH$, the acid obtained **[NSEC-2006]**
(A) D-isomer (B) L-isomer
(C) 80% D + 20% L mixture (D) 50% D + 50% L mixture.

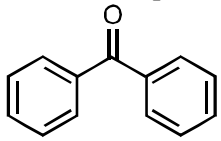
9. 

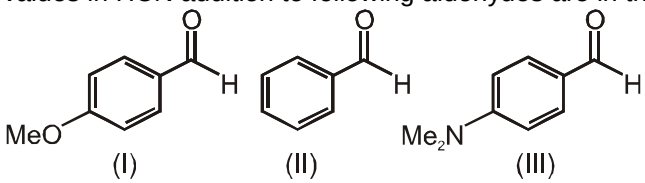
product
The product in this reaction will be **[NSEC-2006]**

(A) 

(B) 

(C) 

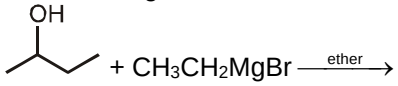
(D) 

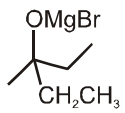
10. The K_{eq} values in HCN addition to following aldehydes are in the order : **[NSEC-2007]**


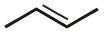
(A) I > II > III (B) II > III > I (C) III > I > II (D) II > I > III

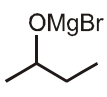
11. Identify the ester which upon addition of excess Grignard's reagent will provide a secondary alcohol : **[NSEC-2007]**
(A) CH_3CO_2Et (B) $(CH_3)_2CHCO_2Et$ (C) HCO_2Et (D) $C_6H_5CO_2Et$

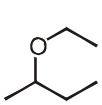
12. Which of the following series contains only nucleophiles ? **[NSEC-2008]**
(A) NH_3, H_2O, CN^-, I^- (B) $AlCl_3$, NH_3, H_2O, I^-
(C) $AlCl_3$, BF_3, H_2O, NH_3 (D) $AlCl_3$, BF_3, NO_2^+, NH_3

13. The product/s of the following reaction is/are **[NSEC-2010]**


(A) 

(B) 

(C) 

+ CH_3CH_3 (D) 

14. The best nucleophile among the following is : **[NSEC-2011]**
(A) H_2O (B) CH_3SH (C) Cl^- (D) NH_3

15. A catalyst accelerates a reaction primarily by stabilizing the **[NSEC-2012]**
(A) substrate (B) product (C) intermediate (D) transition state

16. Which of the following information is not provided by a reaction mechanism? **[NSEC-2012]**
(A) Which bonds are formed and which bonds are broken
(B) Which intermediates and transition states are formed.
(C) Energy content of the reacting species
(D) Which is the slowest step

17. When a nucleophile attacks a carbonyl group to form an intermediate, the hybridisation of the carbon atom changes from **[NSEC-2014]**
(A) sp^3 to sp^2 (B) sp^2 to sp (C) sp to sp^2 (D) sp^2 to sp^3

18. The product X formed in the following reaction is **[NSEC-2014]**

$$C_6H_5MgBr + CH_3OH \rightarrow X$$

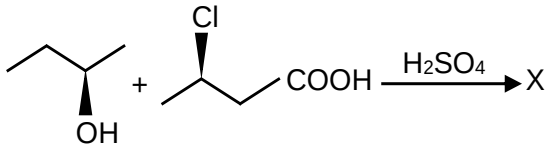
(A) benzene (B) methoxybenzene (C) phenol (D) toluene

19. A group which departs from the substrate in a nucleophilic substitution reaction is called a leaving group. The ease of departure is determined by the acidity of the conjugate acid of the leaving group; higher the acidity better is the leaving group. The correct order of the reactivity of the following compounds in a given nucleophilic reaction is : **[NSEC-2016]**
(A) R-Cl > R-$OCOCH_3$ > R-OSO_2CH_3 > RI (B) R-OSO_2CH_3 > R-Cl > R-$OCOCH_3$ > ROH
(C) R-I > RNH_2 > R-$OCOCH_3$ > R-OSO_2CH_3 (D) R-Br > R-OSO_2CH_3 > R-$OCOCH_3$ > $ROCH_3$

20. The correct order of the ability of the leaving group is **[NSEC-2017]**
(A) $OCOC_2H_5 > OC_2H_5 > OSO_2Et > OSO_2CF_3$ (B) $OC_2H_5 > OCOC_2H_5 > OSO_2CF_3 > OSO_2Me$
(C) $OSO_2CF_3 > OSO_2Me > OCOC_2H_5 > OC_2H_5$ (D) $OCOC_2H_5 > OSO_3CF_3 > OC_2H_5 > OSO_2Me$

21. The best reaction sequence for the synthesis of 2-pentanone would be - **[NSEC-2017]**
(A) $CH_3CH_2CH_2CHO \xrightarrow{CH_3MgI/ether} X \xrightarrow{H^+,H_2O}$
(B) $CH_3CH_2CH_2CN \xrightarrow{CH_3MgI/ether} X \xrightarrow{H^+,H_2O}$
(C) $CH_3CH_2CH_2CHO \xrightarrow{CH_3MgI/ether} X \xrightarrow{H^+,H_2O}$
(D) $CH_3CH_2CH_2MgI + CH_2O \xrightarrow{ether} X \xrightarrow{H^+,H_2O}$

22. The product 'X' in the following reaction is **[NSEC-2018]**



(A) a racemic mixture of ester (B) an optically inactive ester
(C) an optically active ester (D) a meso ester

PART - III : PRACTICE TEST-2 (IIT-JEE (ADVANCED Pattern))

Max. Time : 1 Hr. **Max. Marks : 66**

Important Instructions

A. General :

1. The test is of 1 hour duration.
2. The Test Booklet consists of 22 questions. The maximum marks are 66.

B. Question Paper Format

3. Each part consists of five sections.
4. Section 1 contains 8 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE is correct.
5. Section 2 contains 6 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE OR MORE THAN ONE are correct.
6. Section 3 contains 4 questions. The answer to each of the questions is a single-digit integer, ranging from 0 to 9 (both inclusive).

7. Section 4 contains 1 paragraphs each describing theory, experiment and data etc. 3 questions relate to paragraph. Each question pertaining to a partcular passage should have only one correct answer among the four given choices (A), (B), (C) and (D).
8. Section 5 contains 1 multiple choice questions. Question has two lists (list-1 : P, Q, R and S; List-2 : 1, 2, 3 and 4). The options for the correct match are provided as (A), (B), (C) and (D) out of which ONLY ONE is correct.

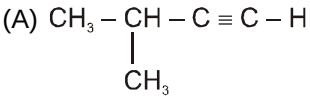
C. Marking Scheme :

9. For each question in Section 1, 4 and 5 you will be awarded 3 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (–1) mark will be awarded.
10. For each question in Section 2, you will be awarded 3 marks. If you darken all the bubble(s) corresponding to the correct answer(s) and zero mark. If no bubbles are darkened. No negative marks will be answered for incorrect answer in this section.
11. For each question in Section 3, you will be awarded 3 marks if you darken only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. No negative marks will be awarded for incorrect answer in this section.

SECTION-1 : (Only One Option Correct Type)

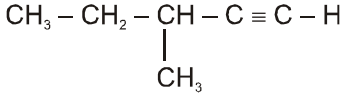
This section contains 8 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which Only ONE option is correct.

1. 0.34 g of hydrocarbon when treated with excess of CH_3MgI liberates 112 mL of CH_4 at STP the structure of hydrocarbon is

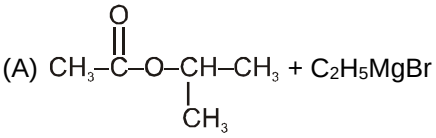
(A) 

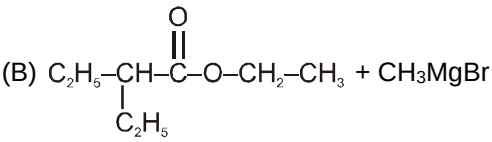
(B) $CH_3–C\equiv C–H$

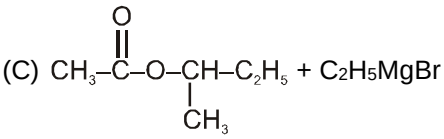
(C) $CH_3–CH_2–C\equiv C–H$

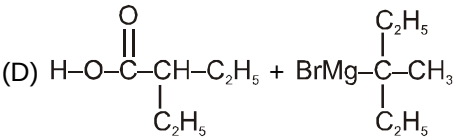
(D) 

2. An ester on treatment with excess of Grignard reagent followed by acidification gives Butane-2-ol and 3-methylpentan-3-ol. Predict the reactant from the following :

(A) 

(B) 

(C) 

(D) 

3. Decreasing order of relative nucleophilicity of the following nucleophiles in protic solvent is :

$\overset{\ominus}{S}H,\ \overset{\ominus}{A}cO,\ \overset{\ominus}{P}hO,\ \overset{\ominus}{O}H,\ H_2O$

(A) $\overset{\ominus}{S}H > \overset{\ominus}{O}H > H_2O > \overset{\ominus}{A}cO > \overset{\ominus}{P}hO$

(B) $\overset{\ominus}{S}H > \overset{\ominus}{O}H > \overset{\ominus}{P}hO > \overset{\ominus}{A}cO > H_2O$

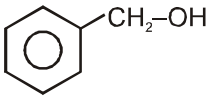
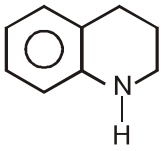
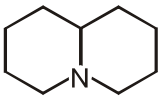
(C) $\overset{\ominus}{S}H > \overset{\ominus}{P}hO > \overset{\ominus}{O}H > H_2O > \overset{\ominus}{A}cO$

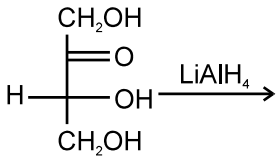
(D) $\overset{\ominus}{O}H > \overset{\ominus}{S}H > \overset{\ominus}{P}hO > \overset{\ominus}{A}cO > H_2O$

4. Which of the following is not nucleophile ?

(A) OH^- (B) CN^- (C) BF_3 (D) NH_3

5. Which of the following will not react with acetyl chloride $CH_3 - \overset{O}{\overset{\|}{C}} - Cl$?

(A) H_2O (B)  (C)  (D) 

6.  Product.

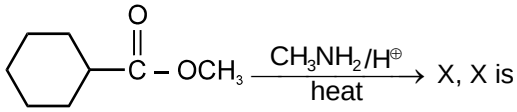
In the given reaction the product is.

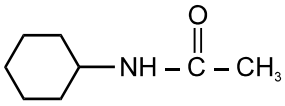
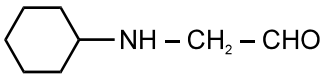
(A) An optically inactive mixture of two compounds

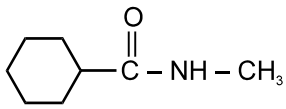
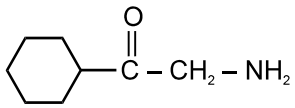
(B) An optically active mixture of two compounds

(C) An optically inactive mixture of three compounds

(D) An optically active mixture of three compounds

7. 

(A)  (B) 

(C)  (D) 

8. Which of the following is not correct order for Nucleophicity as well as basicity.

(A) $HO^{\ominus} >> H_2O$ (B) $NH_2^{\ominus} >> NH_3$ (C) $I^{\ominus} > Br^{\ominus} > Cl^{\ominus} > F^{\ominus}$ (D) $MeO^{\ominus} > HO^{\ominus} > MeCOO^{\ominus}$

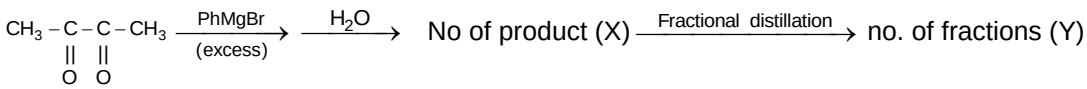
Section-2 : (One or More than one options correct Type)

This section contains 6 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

9. The correct nucleophilicity order(s) is/are:

(A) $CH_3O^{\ominus} > CH_3^{\ominus}$ (B) $CH_3S^{\ominus} > CH_3SH$

(C) $NH_3 > H_2O$ (D) $(CH_3CH_2)_3N > (CH_3CH_2)_3P$

10. 

X and Y are :

(A) 3 (B) 2 (C) 4 (D) 5

11. Which of the followings give product by S_N2Th mechanism ?

(A) $CH_3 - \overset{O}{\overset{\|}{C}} - Cl \xrightarrow{NaOH} CH_3 - \overset{O}{\overset{\|}{C}} - OH$ (B) $CH_3–CH_2–Cl \xrightarrow{NaOH} CH_3–CH_2–OH$

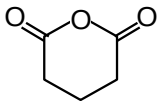
(C) $CH_3 - \overset{O}{\overset{\|}{C}} - OH \xrightarrow{PCl_5} CH_3 - \overset{O}{\overset{\|}{C}} - Cl$ (D) $CH_3 - \underset{CH_3}{\underset{|}{CH}} - OH \xrightarrow{PCl_5} CH_3 - \underset{CH_3}{\underset{|}{CH}} - Cl$

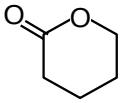
12. Choose the correct order of nucleophilicity.

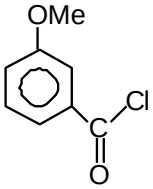
(A) $F^{\ominus}_{(DMSO)} > Cl^{\ominus}_{(DMSO)} > Br^{\ominus}_{(DMSO)} > I^{\ominus}_{(DMSO)}$ (B) $F^{\ominus}_{(aq)} > Cl^{\ominus}_{(aq)} > Br^{\ominus}_{(aq)} > I^{\ominus}_{(aq)}$

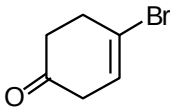
(C) $I^{\ominus}_{(aq)} > Br^{\ominus}_{(aq)} > Cl^{\ominus}_{(aq)} > F^{\ominus}_{(aq)}$ (D) $I^{\ominus}_{(DMSO)} > Br^{\ominus}_{(DMSO)} > Cl^{\ominus}_{(DMSO)} > F^{\ominus}_{(DMSO)}$

13. NaSH will produce a substitution product in significant quantity with :

(A) 

(B) 

(C) 

(D) 

14. Which statement is/are correct for halogen

(A) Bond dissociation energy for $H-X$ follow $H-F > H-Cl > H-Br > H-I$

(B) Basicity order follows $F^- > Cl^- > Br^- > I^-$

(C) Nucleophilicity order follows $I^- > Br^- > Cl^- > F^-$

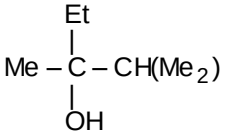
(D) Electronegativity order follows $F > Cl > Br > I$

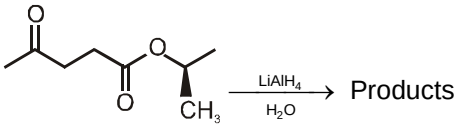
Section-3 : (Single/ Double Integer Value Correct Type.)

This section contains 4 questions. Each question, when worked out will result in one integer from 0 to 9 (both inclusive)

15. A sample of 3 mg of an unknown alcohol (ROH) is added to methyl magnesium iodide then 1.12 ml gas is evolved. What will be the molecular weight of alcohol is

16. How many types of Grignard reagent (RMgCl) can be used to prepare the following alcohol, by using different Ketones.



17. 

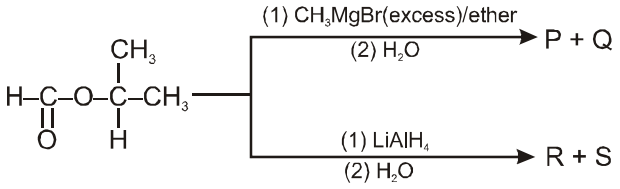
Total number of products in the above reaction :

18. On conversion into the Grignard reagent followed by treatement with water how many structural alkyl bromides would yield isopentane ?

SECTION-4 : Comprehension Type (Only One options correct)

This section contains 1 paragraphs, each describing theory, experiments, data etc. 3 questions relate to the paragraph. Each question has only one correct answer among the four given options (A), (B), (C) and (D)

Paragraph for Questions 19 to 21

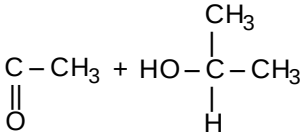


19. The product P and Q are respectively :

(A) $CH_3OH + (CH_3)_2CHOH$

(B) $(CH_3)_2CHOH + CH_3OH$

(C) $(CH_3)_2CHOH + (CH_3)_2CHOH$

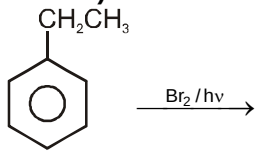
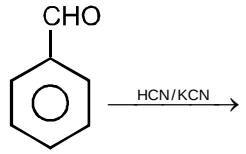
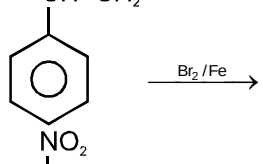
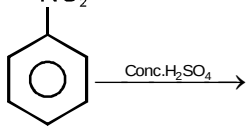
(D) 

20. The product R and S are :
(A) Both 2º alcohols. (B) Both 1º alcohols.
(C) One is 1º-OH, other is 2º-OH. (D) One of these is $CH_3–CH_2–OH$.

21. One of the product of following reaction is :
(P or Q or R or S) + $CH_3MgBr \longrightarrow$
(A) 3º alcohol (B) An ether (C) Methane (D) Propane

SECTION-5 : Matching List Type (Only One options correct)
This section contains 1 questions, each having two matching lists. Choices for the correct combination of elements from List-I and List-II are given as options (A), (B), (C) and (D) out of which one is correct

22. Match List I (Reaction) with List II (Type of reaction) and select the correct answer using the code given below the lists :

List I (Reactions)	**List II (Type of mechanism)**
(P) 	(1) Electrophilic addition
(Q) 	(2) Electrophilic substitution
(R) 	(3) Nucleophlic addition
(S) 	(4) Free radical substitution

Codes :

	P	Q	R	S
(A)	1	2	3	4
(B)	4	3	1	2
(C)	3	4	1	2
(D)	4	3	2	1

Practice Test-2 ((IIT-JEE (ADVANCED Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.										
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.										
Que.	**21**	**22**								
Ans.										

APSP Answers

PART - I

1.	(4)	**2.**	(4)	**3.**	(3)	**4.**	(1)	**5.**	(4)
6.	(2)	**7.**	(2)	**8.**	(3)	**9.**	(1)	**10.**	(2)
11.	(2)	**12.**	(3)	**13.**	(2)	**14.**	(3)	**15.**	(3)
16.	(4)	**17.**	(4)	**18.**	(2)	**19.**	(4)	**20.**	(3)
21.	(4)	**22.**	(1)	**23.**	(1)	**24.**	(3)	**25.**	(3)
26.	(2)	**27.**	(4)	**28.**	(2)	**29.**	(3)	**30.**	(3)

PART - II

1.	(A)	**2.**	(D)	**3.**	(D)	**4.**	(B)	**5.**	(B)
6.	(B)	**7.**	(A)	**8.**	(D)	**9.**	(C)	**10.**	(D)
11.	(C)	**12.**	(A)	**13.**	(C)	**14.**	(C)	**15.**	(D)
16.	(C)	**17.**	(D)	**18.**	(A)	**19.**	(B)	**20.**	(C)
21.	(B)	**21.**	(C)						

PART - III

1.	(A)	**2.**	(C)	**3.**	(B)	**4.**	(C)	**5.**	(D)
6.	(B)	**7.**	(C)	**8.**	(C)	**9.**	(BC)	**10.**	(AB)
11.	(AC)	**12.**	(AC)	**13.**	(AC)	**14.**	(ABCD)	**15.**	60
16.	3	**17.**	3	**18.**	4	**19.**	(C)	**20.**	(C)
21.	(C)	**22.**	(B)						

APSP Solutions

PART - I

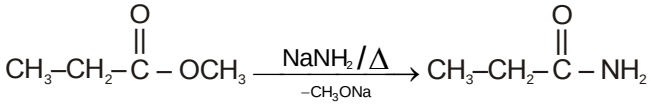
2. The nucleophilicity order is $R^{\ominus} > \overset{\ominus}{N}H_2 > CH_3O^{\ominus} > OH^{\ominus}$

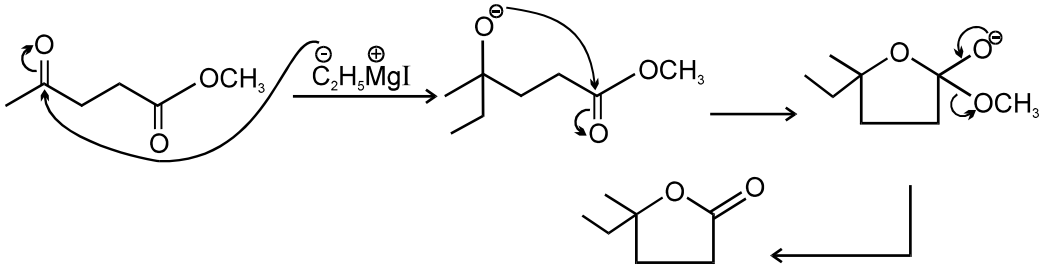
4. $Ph–COCl \xrightarrow{NH_3} Ph–CONH_2 + HCl$

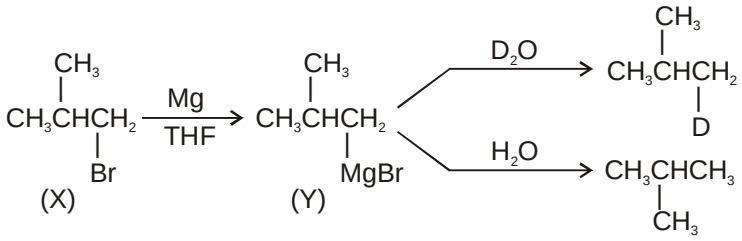
5. The species with incomplete octet can not be a nucleophile.

6. Except HCHO all given carbonyl compound will give recemic mixture (±).

8. Weaker bases are better leaving group.

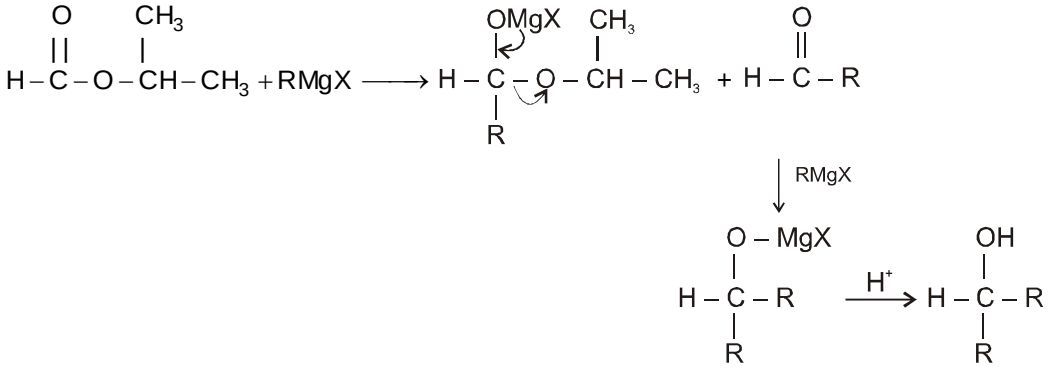
11. 

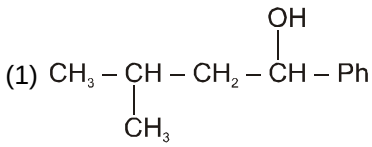
12. 

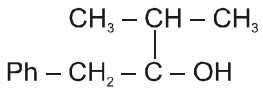
16. 

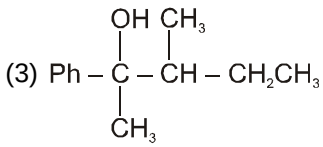
18. All of these reaction give CH_4.

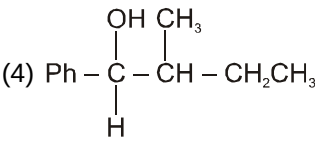
20. Nucleophiles are electron rich species.

26. 

27. (1) 

(2) 

(3) 

(4) 

29. Acid hydrolysis of an ester gives two different organic compounds.

$$CH_3COOC_2H_5 + H_3O^+ \longrightarrow CH_3COOH + C_2H_5OH$$

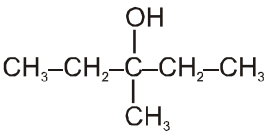
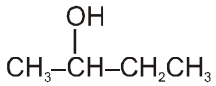
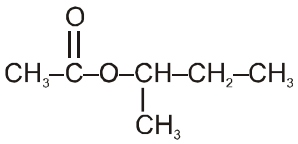
While the acid hydrolysis of an amide gives one organic and one inorganic product as

$$CH_3CONH_2 + H_3O^+ \longrightarrow \underset{\text{organic compound}}{CH_3COOH} + \underset{\text{Inorganic compound}}{NH_3}$$

30. Conjugated base of strong acid is weak base and behave as better leaving group.

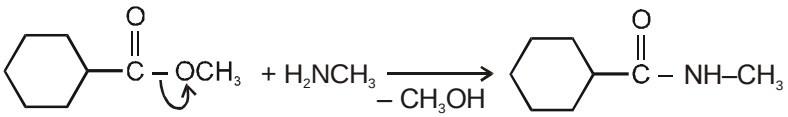
PART - III

2. Alcohols obtained from reaction of ester with Grignard reagent will have two identical alkyl group which comes from Grignard reagent.

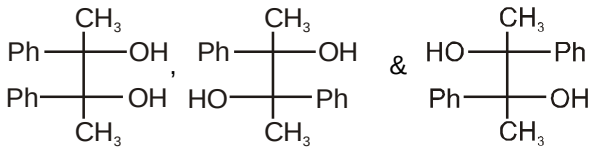
Therefore for  &  reactant should be 

and CH_3CH_2MgBr.

3. Nucleophilicity $\propto$ Size (in group)

7. 

9. Anionic nucleophiles are better nucleophile than their neutral species.

10. 

Methane gas is released on reacting CH_3MgI with a compound containing reactive hydrogen atom. The reaction is used for estimation of reactive hydrogen atoms present in a molecule. This method is called zerewitinaff method of estimation of reactive hydrogen atom.

12. In aprotic solvent $Nu^{\ominus}$ increases, as compare to polar protic solvent.

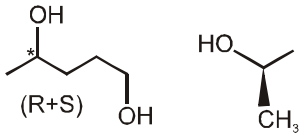
13. HS^- is better base than Cl^- or  . Hence, it can substitute (A) & (C), but not (B) or (D), (D) contain single halide which fails to undergo substitution.

14. Self understood

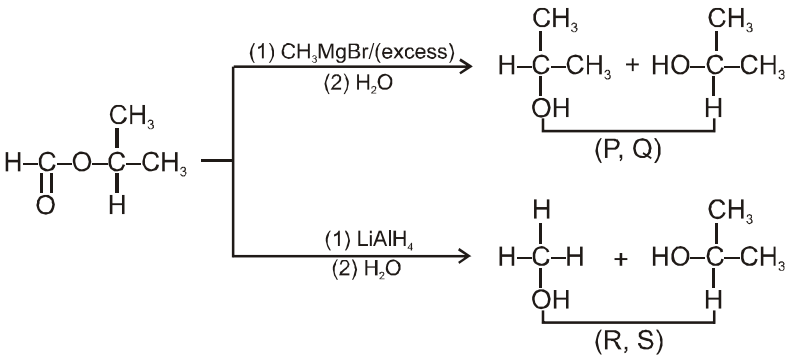
15. Number of millimoles of alcohol = $\frac{1.12 \text{ ml}}{22.4 \text{ ml/m mole}}$

molecular weight of alcohol = $\frac{\text{Wt of alcohol (mg)}}{\text{No. of milli moles of alcohol}} = \frac{3}{1.12/22.4} = 60.$

17.



(19-21)



[P, Q, R, S≡R–OH] + $CH_3MgBr \longrightarrow (CH_4)$ as common product.