Additional Problems for Self Practice (APSP)

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))

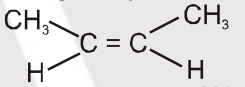
Max. Time : 1 Hr. **Max. Marks : 120**

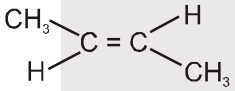
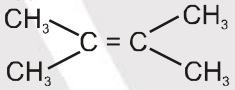
Important Instructions

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.

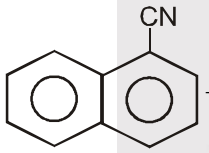
1. Propyne and propene can be distinguished by :
(1) Conc. H_2SO_4 (2) Br_2 in CCl_4
(3) Dil. $KMnO_4$ (4) $AgNO_3$ in ammonia

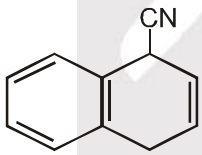
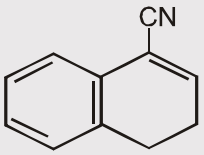
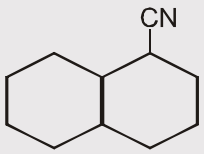
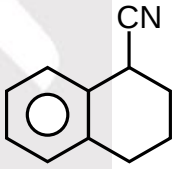
2. The reactivity order towards hydrogenation of the following compounds is

(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

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

(1)  (2)  (3)  (4) 

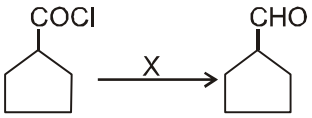
4. The product of following reaction is

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

(1) $PhCH_2CH{=}CHCH_2OH$ (2) $Ph(OH)C{=}CHCH_3$
(3) $PhCH{=}CHCH_2OH$ (4) $PhCH_2CH_2CH_2–OH$

5. 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

6. 

X can be

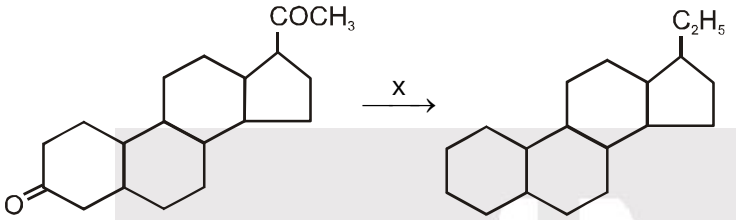
(1) $NaBH_4$/EtOH (2) $LiAlH_4$/THF (3) Na/EtOH (4) H_2/Pd-$BaSO_4$

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

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

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

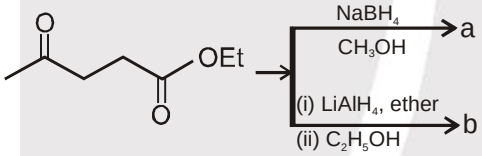
(1) DiBAL-H (2) NH_2–NH_2/KOH (3) Na–Hg/HCl (4) $LiAlH_4$

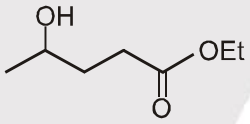
9. 

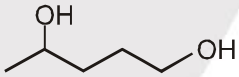
, X can be

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

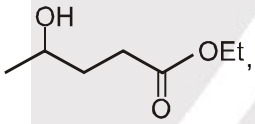
10. Identify a & b, in the following reaction :

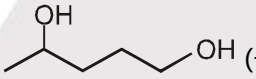


(1) Both are 

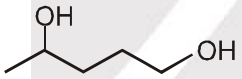
(2) Both are 

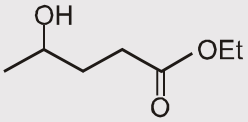
(+ EtOH)

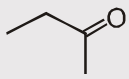
(3) a = 

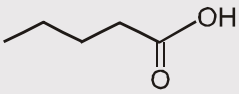
, b = 

(+ EtOH)

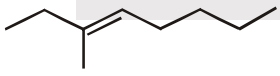
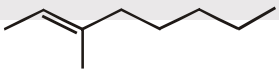
(4) a = 

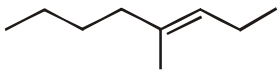
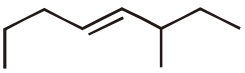
(+ EtOH), b = 

11. Alkene (X) $\xrightarrow[\Delta]{KMnO_4}$ 

+ 

; X is :

(1) 
(2) 

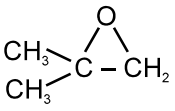
(3) 
(4) 

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

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

(3) Ethanal and methanal (4) Only propanone

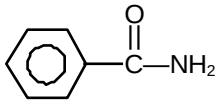
13. $(CH_3)_3CCl \xrightarrow[\Delta]{\text{alc. KOH}} X \xrightarrow{CF_3CO_3H} Y$; The product 'Y' is

(1) CH_2=CH–CH_2OH (2) 

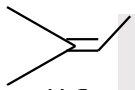
(3) $CH_3COCH_2CH_3$ (4) $(CH_3)_2CHCH_2OH$

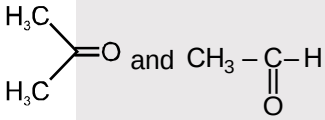
14. Which of the following will decolorise alkaline $KMnO_4$ solution ?
(1) C_3H_8 (2) CH_4 (3) CCl_4 (4) C_2H_4

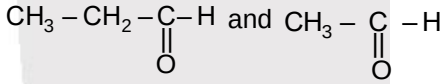
15. Bayer's reagent is :
(1) alkaline permanganate solution
(2) acidified permanganate solution
(3) neutral permanganate solution
(4) aqueous bromine solution

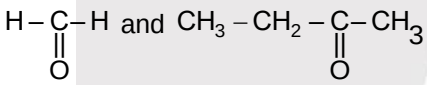
16. (P)  (A) + E(gas) $\xrightarrow{1.\ LiAlH_4}{2.H_2O}$ (B) $\xrightarrow{KMnO_4/H^{\oplus}}$ (C)

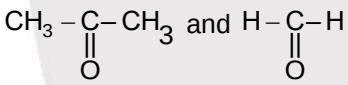
Select correct options, for identical pairs
(1) P, A (2) A, C (3) B, C (4) P, C

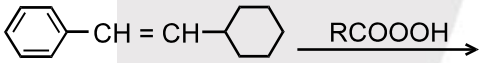
17.  $\xrightarrow[H_2O_2]{OSO_4}$ A $\xrightarrow{HIO_4}$ B + C ; Product B and C are respectively :

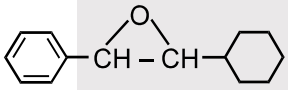
(1) 

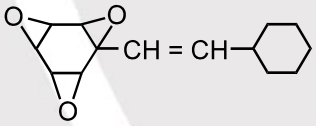
(2) 

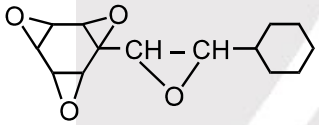
(3) 

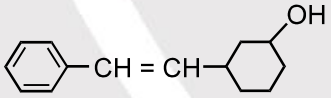
(4) 

18. 

(1) 

(2) 

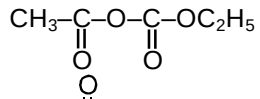
(3) 

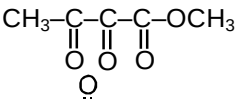
(4) 

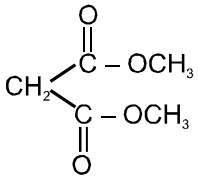
19. Fenton's reagent is :
(1) $FeSO_4 + H_2O_2$ (2) $HgSO_4 + H_2O_2$ (3) $FeSO_4 + H_2O$ (4) None of these

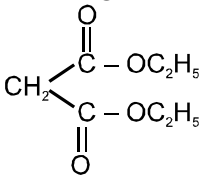
20. The reagent with which both acetaldehyde and acetone react easily is
(1) Tollen's reagent (2) Schiff's reagent
(3) Grignard reagent (4) Fehling reagent

21. 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) 

22. 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

23. Identify the correct statement about MnO_2/Δ

(1) $C_6H_5–CHOH–CH_3$ as well as $CH_3–CH=CH–CH_2OH$ are oxidised

(2) $C_6H_5–CH_2–CH_2–OH$ as well as $CH_2=CH–CH_2–CH_2–OH$ are oxidised

(3) $C_6H_5–CHOH–CH_3$ is not oxidised but $CH_3–CH=CH–CH_2–OH$ is oxidised.

(4) $C_6H_5–CHOH–CH_3$ is oxidised but $CH_3–CH=CH–CH_2OH$ is not oxidised.

24. Which of the following reaction involves homogeneous reduction?

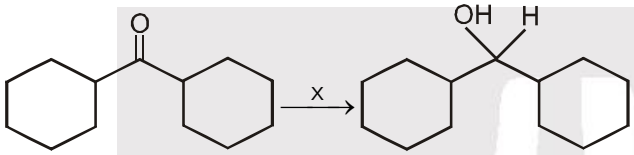
(A) $CH_2=CH_2 \xrightarrow{H_2/Ni} CH_3–CH_3$

(B) $CH_3–C\equiv C–CH_3 \xrightarrow{\text{Wilkinson's catalyst}} CH_3–CH=CH–CH_3$

(C) $CH_3COCl \xrightarrow{H_2/Pd/CaCO_3/\text{quinoline}} CH_3CHO$

(D) $CH_3C\equiv CH \xrightarrow{H_2/Pd/CaCO_3/\text{quinoline}} CH_3CH = CH_2$

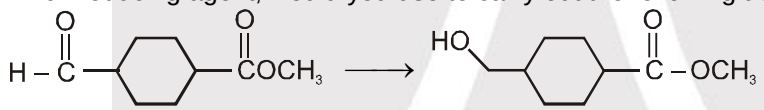
25.



X is :

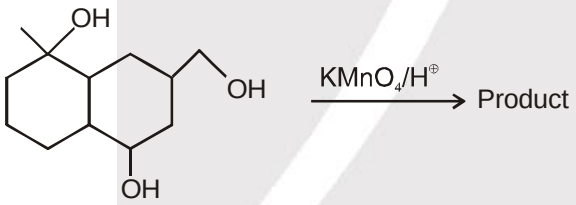
(1) $NaBH_4$/EtOH (2) $LiAlH_4$/THF (3) $Al(OiPr)_3$ / $CH_3–\underset{\underset{OH}{|}}{CH}–CH_3$ (4) All of these

26. Which reducing agent, would you use to carry out the following transformation.

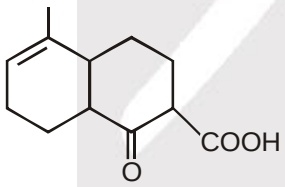


(1) $LiAlH_4$ (2) $NaBH_4$ (3) Na/NH_3 (4) DIBAL-H

27.



(1)



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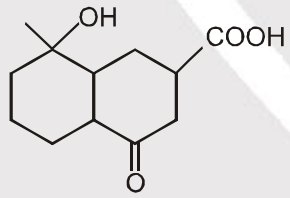

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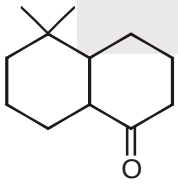
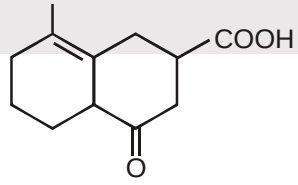
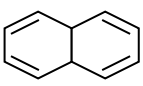
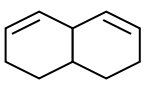
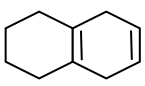
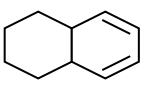


(4)



28. An unknown compound decolorizes bromine in carbon tetrachloride, and it undergoes catalytic reduction to give decalin. When treated with warm, conc. potassium permangate, this compound give cis–cyclohexane-1,2-dicaboxylic acid and oxalic acid. Possible a structure for the unknown compound is -

(1)  (2)  (3)  (4) 

29. The reaction, $Ph - CH_2 - CH = CH - \underset{|}{\overset{OH}{CH}} - CH_3 \xrightarrow[\text{ketone(excess)/ }\Delta]{Al(tBuO)_3} PhCH_2CH = CH - \overset{\|}{\underset{O}{C}} - CH_3$

is known as :

(1) Wolff-kishner reduction (2) Oppenauer oxidation

(3) Meerwein -Ponndorf reaction (4) Clemmensen reduction

30. The reagent used to convert $RCOOH \rightarrow RCH_2OH$ is

(1) $NaBH_4$ (2) Na/ Alcohol (3) Zn/Hg-HCl (4) $LiAlH_4$

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.										

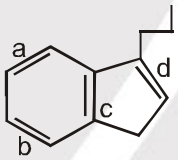
PART - II : NATIONAL STANDARD EXAMINATION IN CHEMISTRY (NSEC) STAGE-I

1. If 2-pentanone is reacted with $NaBH_4$ followed by hydrolysis with D_2O the product will be **[NSEC-2000]**

(A) $CH_3CH(OD)CH_2CH_2CH_3$ (B) $CH_3CD(OH)CH_2CH_2CH_3$

(C) $CH_3CH(OH)CH_2CH_2CH_3$ (D) $CH_3CD(OD)CH_2CH_2CH_3$

2. If 1 mole H_2 is reacted with 1 mole of the following compound. **[NSEC-2000]**



Which double bond will be hydrogenated ?

(A) c (B) b (C) a (D) d

3. Which of the following can not be obtained when alkenes are oxidised with $KMnO_4$ and then followed by acid hydrolysis ? **[NSEC-2001]**

(A) alkanoic acids (B) alkanals (C) alkanones (D) carbon dioxide

4. In the reaction **[NSEC-2001]**

$$CH_3CN + 2H \xrightarrow[\text{ether}]{HCl} X \xrightarrow[\Delta]{H_2O} Y, \text{ Y is}$$

(A) acetaldehyde (B) ethanamine (C) dimethylamine (D) acetone

5. A compound is soluble in conc. H_2SO_4. It does not declourise bromine in carbon tetrachloride but oxidised by chromic anhydride in aqueous sulphuric acid within two seconds, turning orange solution to blue, green and then opaque. The original compound is : **[NSEC-2001]**

(A) an alkane (B) a tertiary alcohol (C) a primary alcohol (D) an ether

6. If 3-hexanone is reacted with $NaBH_4$ followed by hydrolysis with D_2O, the product will be : **[NSEC-2001]**

(A) $CH_3CH_2CH(OD)CH_2CH_2CH_3$ (B) $CH_3CH_2CD(OH)CH_2CH_2CH_3$

(C) $CH_3CH_2CH(OH)CH_2CH_2CH_3$ (D) $CH_3CH_2CD(OD)CH_2CH_2CH_3$

7. Hydrogenation of benzoyl chloride in the presence of Pd and $BaSO_4$ gives : **[NSEC-2001]**
(A) benzyl alcohol (B) benzoic acid (C) benzaldehyde (D) toluene

8. The reaction, $R_2CO + 4[H] \xrightarrow[\text{Conc. HCl}]{\text{Zn–Hg}} R_2CH_2 + H_2O$
is well known as : **[NSEC-2001]**
(A) Wurtz reaction (B) Rosenmund reduction
(C) Kolbe reaction (D) Clemmensen reduction

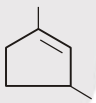
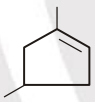
9. Acetone will be obtained on ozonolysis of **[NSEC-2002]**
(A) 1-pentene (B) 2-pentene (C) isopentene (D) 2-pentyne

10. The reducing agent for conversion of $O_2NCH_2CH_2CH=CH_2$ to $H_2NCH_2CH_2CH=CH_2$ is : **[NSEC-2002]**
(A) $LiAlH_4$ (B) H_2/Pd (C) B_2H_6 (D) $NaBH_4$

11. Reduction of an isonitrile gives a **[NSEC-2002]**
(A) primary amine (B) secondary amine
(C) tertiary amine (D) quaternary ammonium salt.

12. Methane may be obtained from monochloromethane by **[NSEC-2002]**
(A) reduction with nascent hydrogen (Zn + HCl) (B) reduction with hydrogen (H_2)
(C) heating with sodium metal in dry ether (D) hydrolysis with aqueous NaOH.

13. The compound which does not react with lithium aluminium hydride is **[NSEC-2003]**
(A) 3-penten-2-one (B) methyl benzoate (C) 2-pentanol (D) propanenitrile

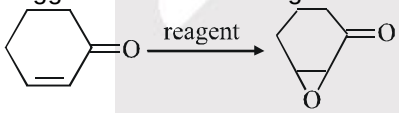
14. The compound that would yield a 5-oxo-2-methylhexanal on ozonolysis is **[NSEC-2004]**
(A)  (B)  (C)  (D) 

15. Reduction of methylbenzoate ($C_6H_5COOCH_3$) to benzyl alcohol ($C_6H_5CH_2OH$) can be accomplished using **[NSEC-2005]**
(A) H_2/Pd (B) $LiAlH_4$ (C) $NaBH_4$ (D) Zn-Hg/HCl

16. Oxidation of cyclopentanol to cyclopentanone can be accomplished by using **[NSEC-2005]**
(A) Tollen's reagent (B) chromic acid (C) bromine water (D) Fehling's solution.

17. Carbonyl compounds can generally be converted to hydrocarbons by **[NSEC-2006]**
(A) H_2/Pt (B) $LiAlH_4$ (C) N_2H_4-KOH (D) $K_2Cr_2O_7$-H_2SO_4

18. To reduce a nitroaldehyde to a nitroalcohol the reducing agent of choice is **[NSEC-2008]**
(A) $LiAlH_4$ (B) $NaBH_4$ (C) Molecular H_2 (D) $SnCl_2$

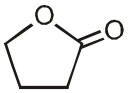
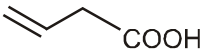
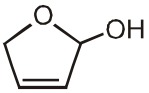
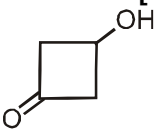
19. Suggest the suitable reagent for the following transformation. **[NSEC-2008]**


(A) meta-chloroperbenzoic acid (B) ozone
(C) potassium dichromate (D) alkaline hydrogen peroxide

20. An isocyanide on reduction with hydrogen in the presence of plantinum gives : **[NSEC-2009]**
(A) amide (B) primary amine
(C) secondary amine (D) alcohol

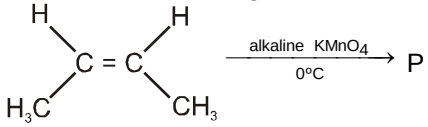
21. Compound X ($C_5H_{10}O$) is a chiral alcohol. It is catalytically hydrogenated to an achiral alcohol Y ($C_5H_{12}O$) and oxidized by activated MnO_2 to an achiral carbonyl compound Z (C_5H_8O). Compound X is **[NSEC-2009]**
(A) 1-penten-3-ol (B) 4-penten-2-ol
(C) 3-methyl-2-buten-1-ol (D) 2-methyl-2-buten-1-ol

22. 4-Oxobutanoic acid is reduced with Na-borohydride and the product is treated with aqueous acid. The final product is : **[NSEC-2009]**

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

23. A solution of sodium metal in liquid ammonia is strongly reducing due to the presence of **[NSEC-2013]**
(A) sodium atoms (B) sodium hydride (C) sodium amide (D) solvated electrons

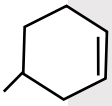
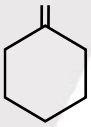
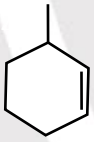
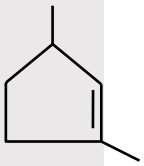
24. Which of the following statements is true for the reaction given below ? **[NSEC-2013]**



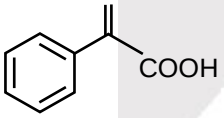
(A) P is a meso compound of 2,3-butanediol formed by syn addition.
(B) P is a meso compound of 2,3-butanediol formed by anti addition.
(C) P is a racemic mixture of d- and l-2,3-butanediol formed by anti addition.
(D) P is a racemic mixture of d- and l-2,3-butanediol formed by syn addition.

25. Complete catalytic hydrogenation of naphthalene gives decalin ($C_{10}H_{18}$). The number of isomers of decalin formed and the total number of isomers of decalin possible are respectively. **[NSEC-2016]**
(A) 1, 2 (B) 2, 2 (C) 2, 4 (D) 3, 4

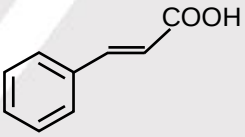
26. Which of the following on treatment with hot concentrated acidified $KMnO_4$ will give 2-methylhexane-1,6-dioic acid as the only organic product? **[NSEC-2017]**

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

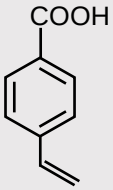
27. An organic compound 'P' with molecular formula $C_9H_8O_2$ on oxidation gives benzoic acid as one of the products. The possible structure/s of 'P' is/are **[NSEC-2017]**



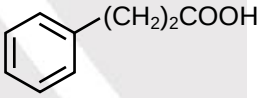
(I)



(II)



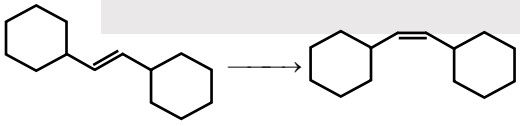
(III)



(IV)

(A) I and III (B) II and IV (C) I and II (D) II only

28. The correct sequence of reagents from those listed below for the following conversion is **[NSEC-2018]**



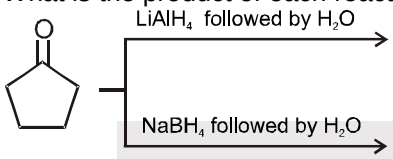
I. $NaNH_2$ II. Br_2
III. H_2/Pd-C, quinolone IV. H_3O^+
(A) IV – I – III (B) III – IV – I (C) II – I – III (D) I – II – III

PART - III : HIGH LEVEL PROBLEMS (HLP)

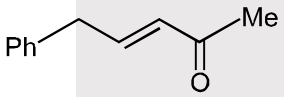
SUBJECTIVE QUESTIONS

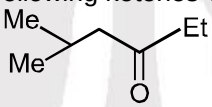
1. An alkene (A) $C_{16}H_{16}$ on ozonolysis gives only one product (B) C_8H_8O. Compound (B) reaction with NaOH / I_2 yields sodium benzoate. Compound (B) reacts with KOH / NH_2NH_2 yielding a hydrocarbon (C) C_8H_{10}. Write the structures of compound (B) & (C). Based on this information two isomeric structures can be proposed for alkene (A). Write their structure and identify the isomer which on catalytic hydrogenation (H_2/Pd–C) gives a racemic mixture. **[JEE-2001, 5/100]**

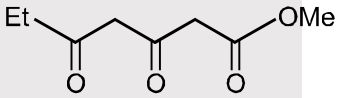
2. What is the product of each reaction



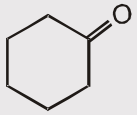
3. Which alcohol is prepared from the following ketones via MPV reduction ?

(a) 

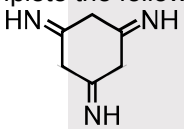
(b) 

(c) 

4. Complete the following

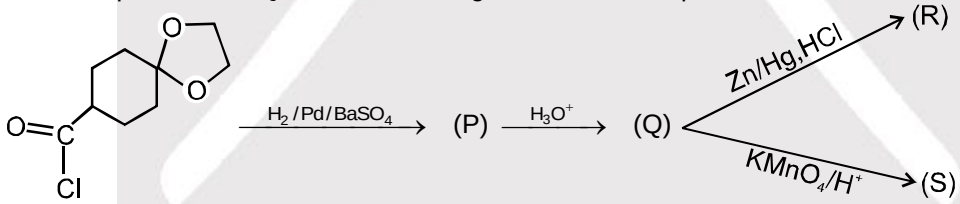
(a) $CH_3–CHO \xrightarrow[\Delta]{SeO_2}$; (b) $H_3C–CH_2–\overset{\overset{O}{\|}}{C}–CH_3 \xrightarrow[\Delta]{SeO_2}$; (c)  $\xrightarrow[\Delta]{SeO_2}$

5. Complete the following

(a)  $\xrightarrow{H_3O^{\oplus}}$

(b) $Ph–O–CH=CH_2 \xrightarrow{H_3O^{\oplus}}$ A + B

6. Write the products P, Q, R and S in the given reaction sequence.

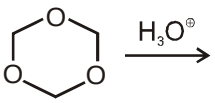


ONLY ONE OPTION CORRECT TYPE

7. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.

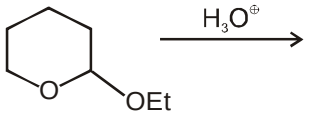
(A) bromine, CCl_4 (B) H_2, Lindlar catalyst

(C) dilute H_2SO_4, $HgSO_4$ (D) ammonical Cu_2Cl_2 solution **[JEE-2002, 3/90]**

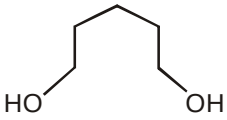
8.  $\xrightarrow{H_3O^{\oplus}}$

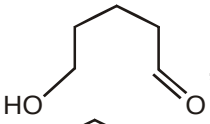
Product obtained in above reaction is :

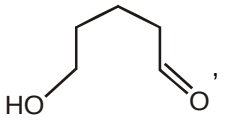
(A) $3CH_3CHO$ (B) 3HCHO (C) 3HCOOH (D) $3CH_3OH$

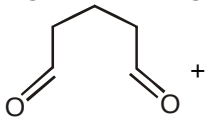
9. 

Product of above reaction is :

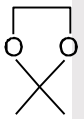
(A)  , EtOH

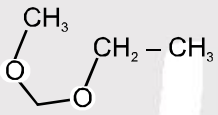
(B)  , EtOH

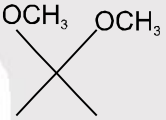
(C)  , CH_3OH

(D)  + EtOH

10. Which of the following gives CH_3–OH and $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$ on hydrolysis with H_3O^+.

(A) 

(B) 

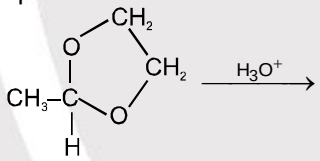
(C) 

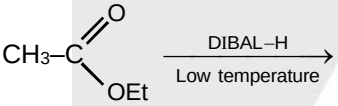
(D) $CH_3–O–CH_2–CH_2–CH_2–CH_3$

SINGLE AND DOUBLE VALUE INTEGER TYPE

11. In how many reaction CH_3–CHO is obtained as major product ?

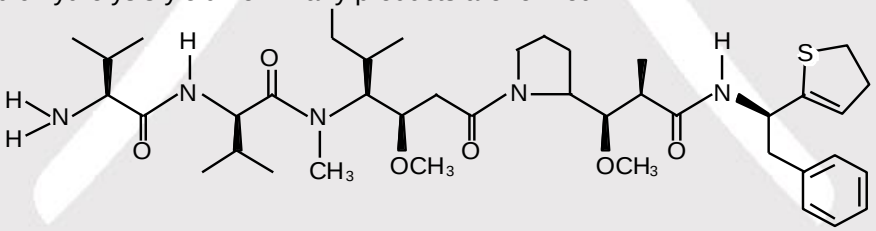
(P) $CH_3–C\equiv N \xrightarrow[2.\ H_3O^+]{1.\ SnCl_2/dil.\ HCl}$

(Q) 

(R) 

(S) $CH_3–C\equiv N \xrightarrow[2.\ H_3O^+]{1.\ DIBAL–H}$

12. Dolastatin is an anti cancer compound isolated from Indian sea have Dobabella ausiculasia. One mole of it on acidic hydrolysis yield how many products are formed.

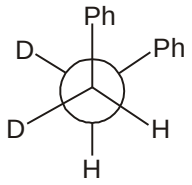


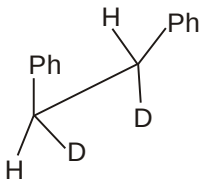
13. How many para substituted benzenoid isomers of $C_8H_8O_2$ gives 1, 4-dihydroxy benzene on hydrolysis ?

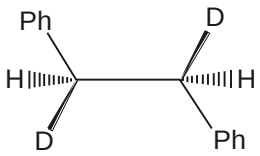
ONE OR MORE THAN ONE OPTIONS CORRECT TYPE

14. The end product of following reaction is / are :

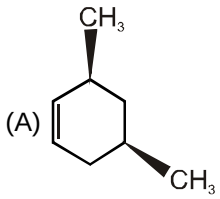
$Ph–C\equiv C–Ph \xrightarrow[(1)]{H_2\ /\ Pd\ /\ BaSO_4\ /\ Quinoline} \xrightarrow[(2)]{D_2\ /\ Ni}$

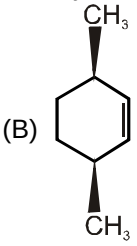
(A) $Ph–CH_2–CD_2–Ph$ (B) 

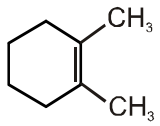
(C) 

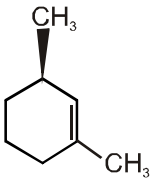
(D) 

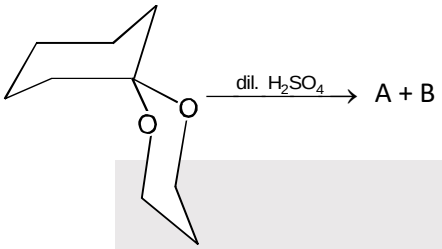
15. Which of the following give only meso compound on catalytic reduction ?

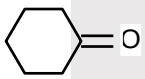
(A) 

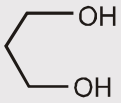
(B) 

(C) 

(D) 

16. 

(A) 

(B) 

(C) 

(D) None of these

PART - IV : 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

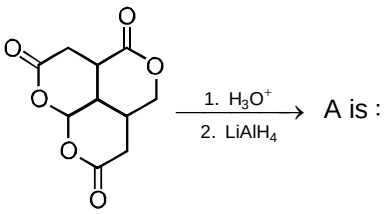
3. Each part consists of five sections.
4. Section-1 contains 8 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE is correct.
5. Section-2 contains 5 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE OR MORE THAN ONE are correct.
6. Section-3 contains 6 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. 2 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 :

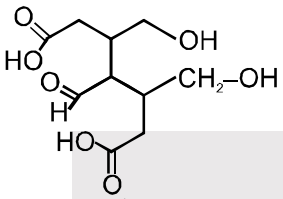
9. For each question in Section 1, 4 and 5 you will be awarded 3 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (–1) mark will be awarded.
10. For each question in Section 2, you will be awarded 3 marks. If you 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.

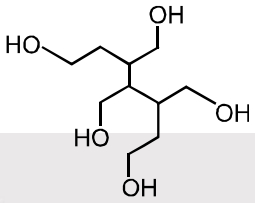
SECTION-1 : (Only One option correct Type)

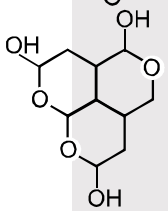
This section contains 8 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which Only ONE option is correct.

1. 

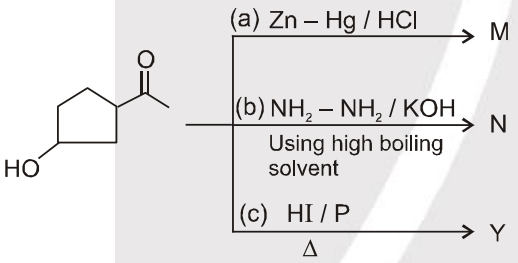
A is :

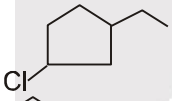
(A) 

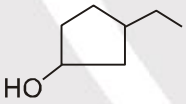
(B) 

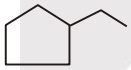
(C) 

(D) None

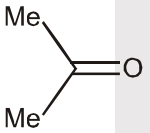
2. 

(A) M is 

(B) N is 

(C) Y is 

(D) All of these are correct

3. 

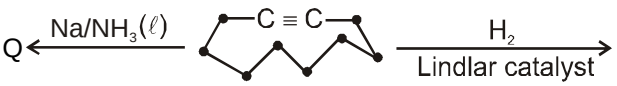
+ SeO_2 ⟶ (P). (P) will not :

(A) reduce Tollens reagent.

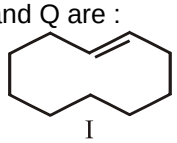
(B) give Iodoform test.

(C) form dioxime

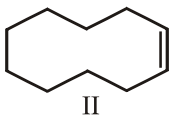
(D) give cerric ammonium nitrate test.

4. 

P and Q are :

(A)  in both cases

I

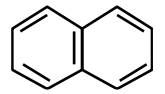
(B)  in both cases

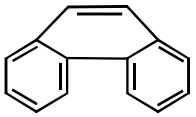
II

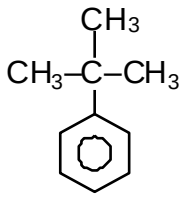
(C) P is I, Q is II

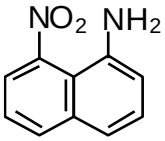
(D) P is II, Q is I

5. Which of the following Reaction is not possible ?

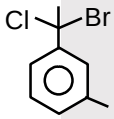
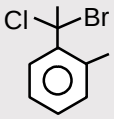
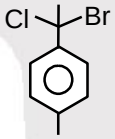
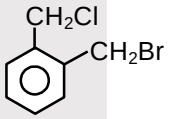
(A)  $\xrightarrow[\Delta]{alk.KMnO_4}$

(B)  $\xrightarrow[\Delta]{alk.KMnO_4}$

(C)  $\xrightarrow[\Delta]{alk.KMnO_4}$

(D)  $\xrightarrow[\Delta]{alk.KMnO_4}$

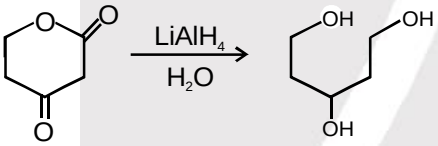
6. Hydrolysis of a compound $C_9H_{10}ClBr$ (P) yields $C_9H_{10}O$(Q)
(Q) gives positive haloform test ?
Strong oxidation of (Q) yields a dibasic acid which gives only two mono-nitro derivative.
What is the structure of (P) ?

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

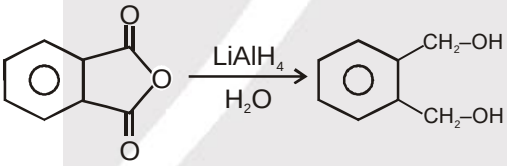
Section-2 : (One or More than one options correct Type)

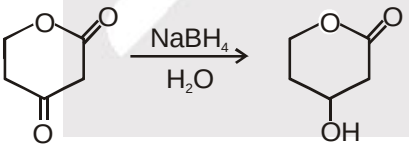
This section contains 5 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

7. Which of the following reaction is/are correct ?

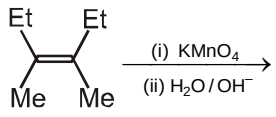
(A) 

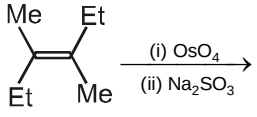
(B) $CH_3–C\equiv N \xrightarrow[H_2O]{LiAlH_4} CH_3–CH_2–NH_2$

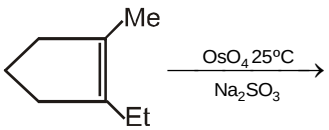
(C) 

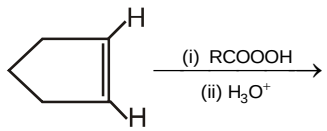
(D) 

8. Which of the following will give syn addition ?

(A) 

(B) 

(C) 

(D) 

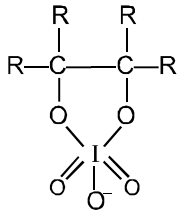
9. Periodic acid is generally used for the oxidation of vicinal diols or α-hydroxycarboxyl compounds. Which of the following statements are correct for this reaction

(A) oxidative cleavage takes place in the above reactions.

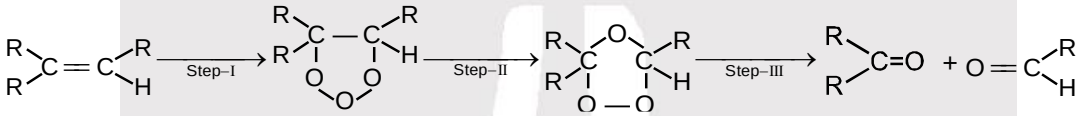
(B) final products are generally carbonyl compounds or carboxylic acids.

(C) HIO_4 reduced into HIO_3

(D) Intermediate of this reaction for a vicinal diol is



10. Mechanism of reductive ozonolysis is given below for an alkene.



Which is correct for the above mechanism

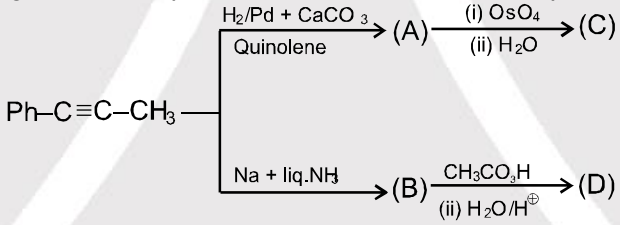
(A) Ozone act as electrophile and as well as nucleophile in this reaction

(B) First step of this reaction is an electrophilic addition

(C) ozonide is formed in the step-II

(D) When ozonide is cleaved in the presence of reducing agent such as Zn or Me_2S the products will be aldehydes and/or ketones.

11. Observed the following reaction sequence and choose the correct options.



(A) (A) and (B) are diastereomer's of each other.

(B) upon catalytic hydrogenation (A) and (B) gives same product

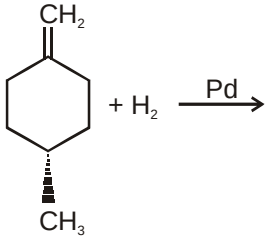
(C) Product (C) and (D) are Identical

(D) Product (C) and (D) are separated by fractional distillation.

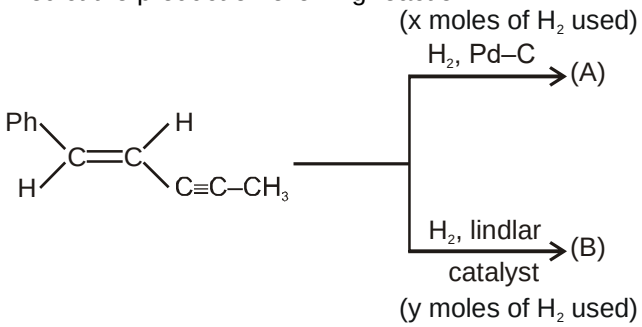
Section-3 : (Single/ Double Integer Value Correct Type.)

This section contains 6 questions. Each question, when worked out will result in one integer from 0 to 9 (both inclusive)

12. How many Stereoisomers are formed in following reaction ?



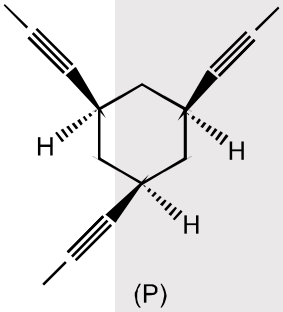
13. Predict the product of following reaction.



Find the value of (x + y).

14. Compound X gives smallest acid & smallest 2º amine on hydrolysis. What is the molecular weight of compound X ?

15.



(P)

(P) $\xrightarrow{Na/NH_3(\ell)}$ Product(s)

The product(s) has/have **X** = degree of unsaturation and **Y** = number of isomeric product(s) formed.
Then X + Y = ?

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

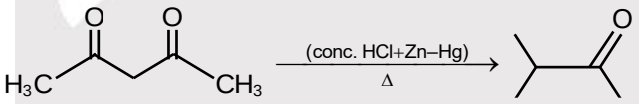
This section contains 1 paragraphs, each describing theory, experiments, data etc. 3 questions relate to the paragraph. Each question has only one correct answer among the four given options (A), (B), (C) and (D)

Paragraph for Questions 16 to 17

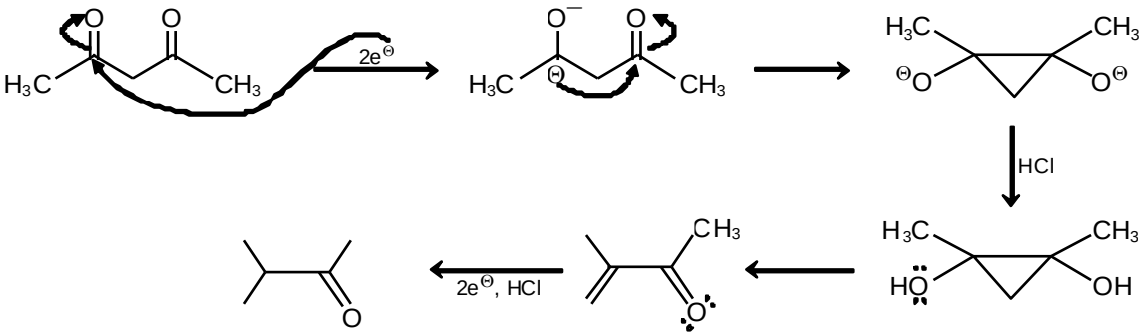
(Read the paragraph carefully and give the answer of following questions.

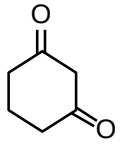
Generally, during the clemmenson reduction >C=O group converts into >CH_2 after reacting with (conc. HCl + Zn–Hg). But in case of β-diketo compounds, its give unexpected products.

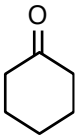
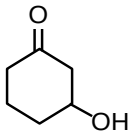
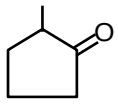
Ex :

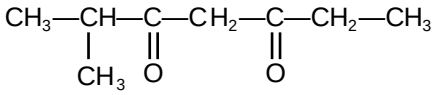


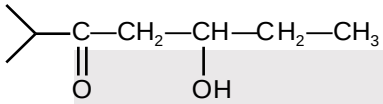
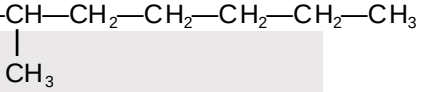
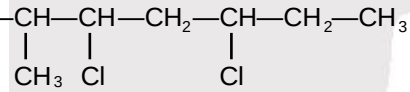
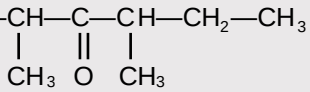
Mechanism : $Zn \longrightarrow Zn^{2+} + 2e^-$



16.  $\xrightarrow[\Delta]{\text{(conc. HCl+Zn–Hg)}}$ Product (X), (X) will be :

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

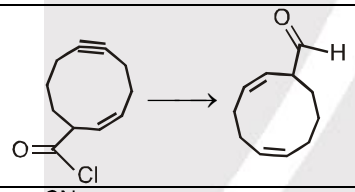
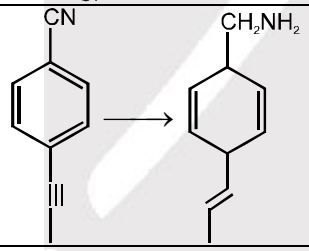
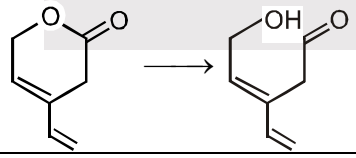
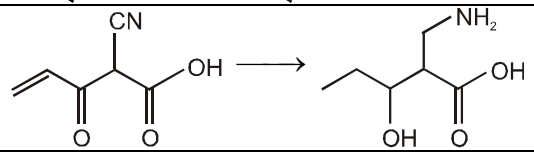
17.  $\xrightarrow[\Delta]{\text{Zn–Hg + conc.HCl}}$ Product (X), (X) will be :

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

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

18. Match the reducing agents of **List**-II with the reaction of **List**-I and select the correct answer using the code given below the lists.

	List-I		**List-II**
P.		1.	DIBAL-H
Q.		2.	H_2/Ni, (25ºC)
R.		3.	Na / NH_3 (ℓ) / C_2H_5OH
S.		4.	H_2/Pd/$BaSO_4$ / quinoline

Code :

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

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		
Ans.										

APSP Answers

PART - I

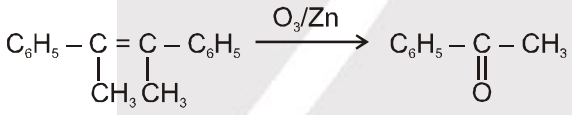
1.	(4)	**2.**	(1)	**3.**	(1)	**4.**	(4)	**5.**	(1)
6.	(4)	**7.**	(2)	**8.**	(2)	**9.**	(4)	**10.**	(3)
11.	(1)	**12.**	(1)	**13.**	(2)	**14.**	(4)	**15.**	(1)
16.	(2)	**17.**	(1)	**18.**	(1)	**19.**	(1)	**20.**	(3)
21.	(3)	**22.**	(3)	**23.**	(1)	**24.**	(2)	**25.**	(4)
26.	(2)	**27.**	(2)	**28.**	(4)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

PART - II

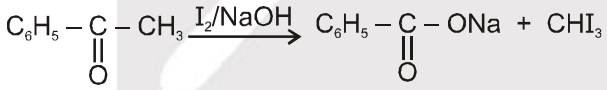
1.	(A)	**2.**	(D)	**3.**	(B)	**4.**	(A)	**5.**	(C)
6.	(A)	**7.**	(C)	**8.**	(D)	**9.**	(C)	**10.**	(A)
11.	(B)	**12.**	(A)	**13.**	(C)	**14.**	(B)	**15.**	(B)
16.	(B)	**17.**	(C)	**18.**	(B)	**19.**	(D)	**20.**	(C)
21.	(A)	**22.**	(A)	**23.**	(D)	**24.**	(A)	**25.**	(A)
26.	(C)	**27.**	(C)	**28.**	(C)				

PART - III

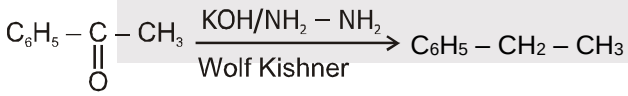
1.



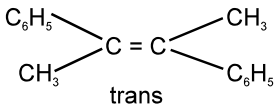
(A) (B)



(B)

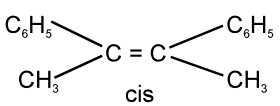


(B)

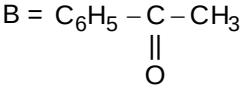
A = 

trans

or

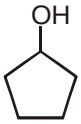


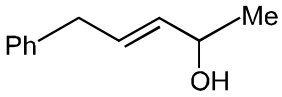
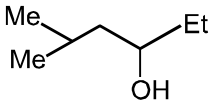
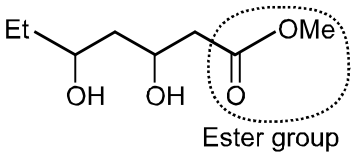
cis

B = 

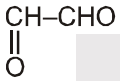
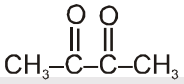
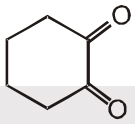
C = $C_6H_5 – CH_2 – CH_3$

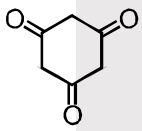
Trans isomer give racemic mixture.

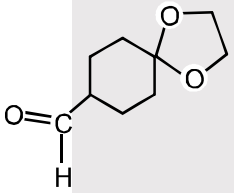
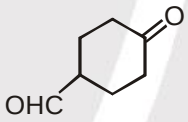
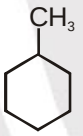
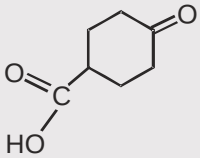
2. 

3. (a)  (b)  (c) 

In (a), the (C=C) bond is not reduced and in (c), the ester (–COOMe) is not reduced in MPV reduction.

4. (a)  (b)  (c) 

5. (a)  (b) A = PhOH, B = MeCHO

6. (P)  (Q)  (R)  (S) 

7.	(D)	**8.**	(B)	**9.**	(B)	**10.**	(C)	**11.**	4
12.	6	**13.**	1	**14.**	(BC)	**15.**	(AC)	**16.**	(AB)

PART - IV

1.	(B)	**2.**	(D)	**3.**	(D)	**4.**	(D)	**5.**	(C)
6.	(B)	**7.**	(ABCD)	**8.**	(ABC)	**9.**	(ABCD)	**10.**	(ABCD)
11.	(ABC)	**12.**	2	**13.**	4	**14.**	73	**15.**	5
16.	(D)	**17.**	(D)	**18.**	(A)				

APSP Solutions

PART - I

1. Terminal alkyne gives white ppt with ammonical silver nitrate.

$$CH_3—C\equiv CH + NH_3 + AgNO_3 \rightarrow \underset{\text{white ppt.}}{CH_3—C\equiv C.\ Ag} + NH_4NO_3$$

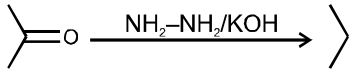
while propene does not give any reaction with ammonical $AgNO_3$ due to absence of acidic hydrogen.

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

3. It is birch reduction

6. –COCl converts in –CHO by H_2/Pd-$BaSO_4$ (Rosenmund reduction)

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



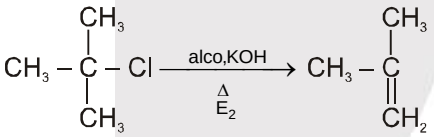
9. All reagents are used to convert >C = O to >CH_2

10. Esters are not reduced by $NaBH_4$, >C=O (carbonyl) change to –CH(OH) by use of $NaBH_4$

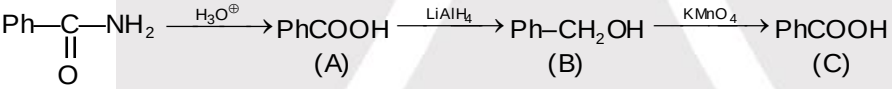
11.

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

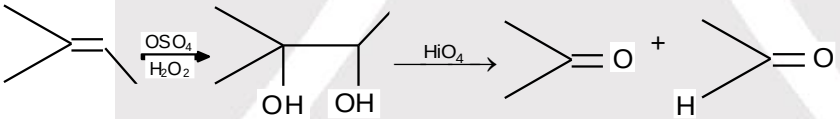
13.



16.

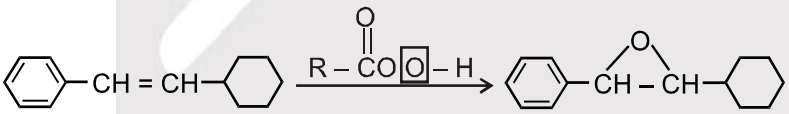


17.



Syn addition

18.



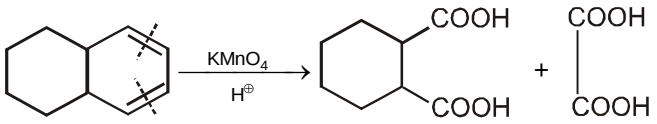
19. It is fact.

21. (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.

24. Reduction with Wilkinson's catalyst is homogeneous

25. X can be $NaBH_4$/EtOH or $LiAlH_4$/THF or $Al(OiPr)_3$ / CH_3–CH(OH)–CH_3

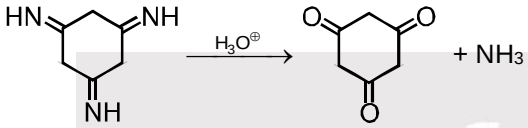
26. $NaBH_4$ can not reduces ester.

28. 

29. Oppenauer's oxidation, oxidised secondary alcohol into ketone and there is no effect on double bond.

30. It is fact.

PART - III

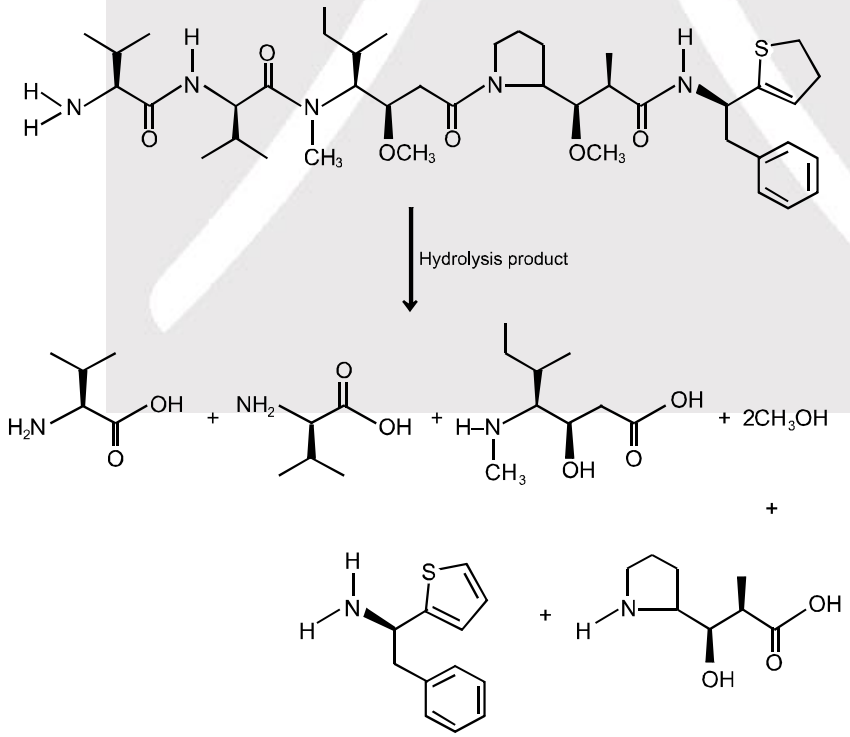
5. (a) 

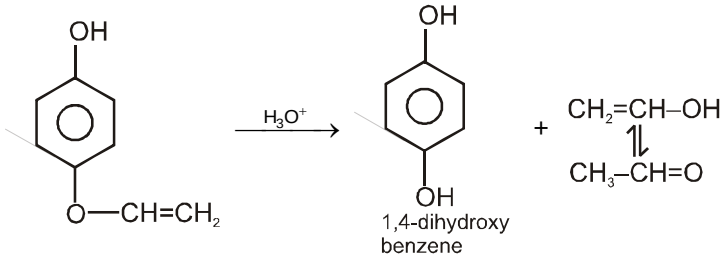
(b) $Ph–O–CH=CH_2 \xrightarrow{H_3O^{\oplus}} PhOH + MeCHO$

7. $CH_3–CH_2–C\equiv CH \xrightarrow[NH_4OH]{Cu_2Cl_2} \underset{\text{Blood red Colour}}{CH_3–CH_2–C\equiv C^{\ominus}Cu^{\oplus}} + NH_4Cl + H_2O$

10. Only C on hydrolysis gives $CH_3–OH$ and $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$.

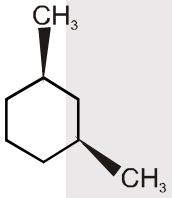
11. All four reactions gives $CH_3–CHO$ as major product.

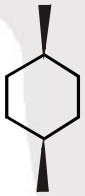
12. 

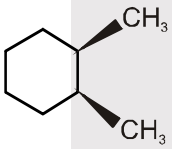
13. 

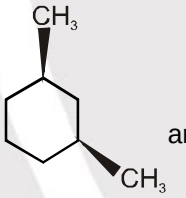
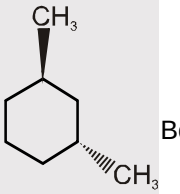
14. $Ph–C\equiv C–Ph \xrightarrow[(1)]{H_2 \,/\, Pd \,/\, BaSO_4 \,/\, Quinoline} Ph–CH=CH–Ph \xrightarrow[(2)]{D_2 \,/\, Ni} Ph–CHD–CHD–Ph$

trans meso

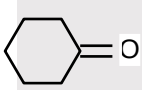
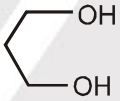
15. (A)  meso

(B)  Not meso

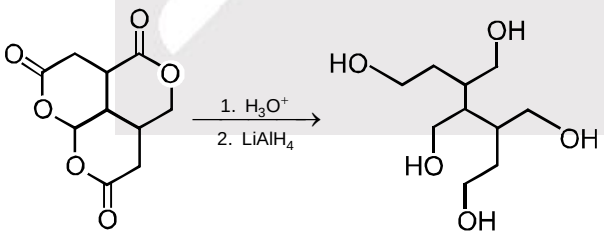
(C)  meso

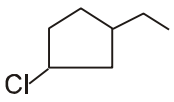
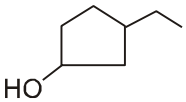
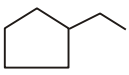
(D)  and  Both

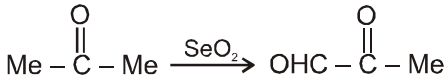
16. Reaction is hydrolysis of acetal.

 and  are Products.

PART - IV

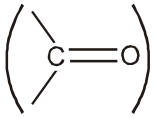
1. 

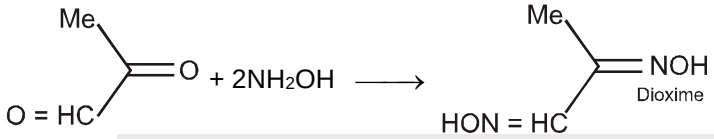
2. M =  , N =  , Y = 

3. 

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

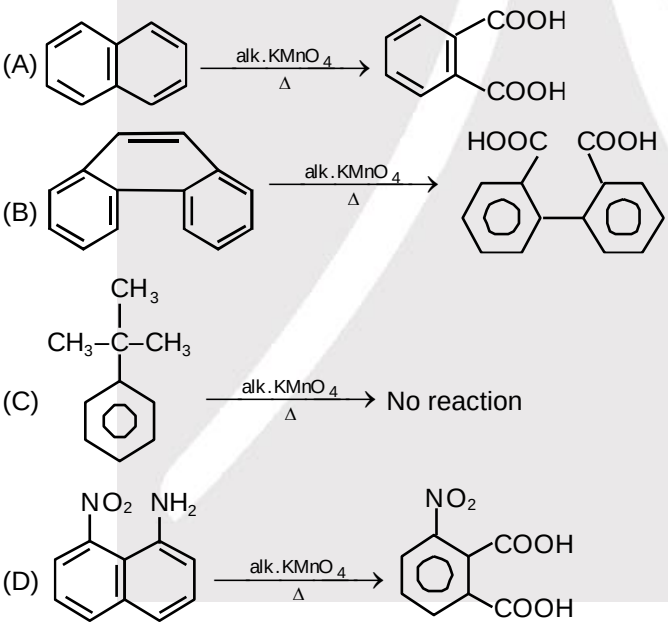
In (b), (P) gives iodoform test, since it contains (MeCO–) group.

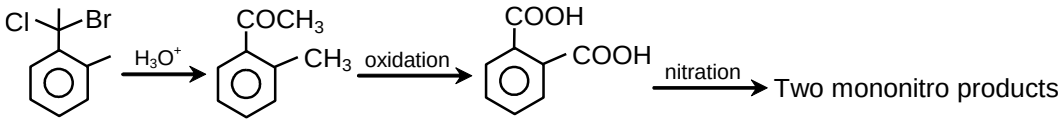
In (c), (P) forms dioxime, since it contains (–CHO) and  groups.



In (d), (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 (D).

4. cis-alkene formed by lindlar catalyst and trans-alkene formed by Na/NH_3.

5. 

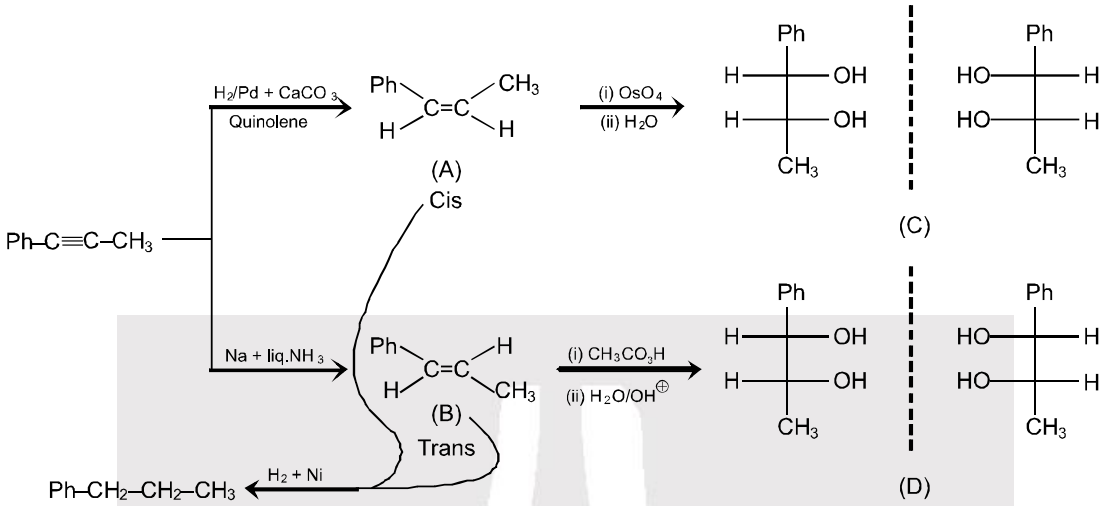
6. 

8. Self explanatory.

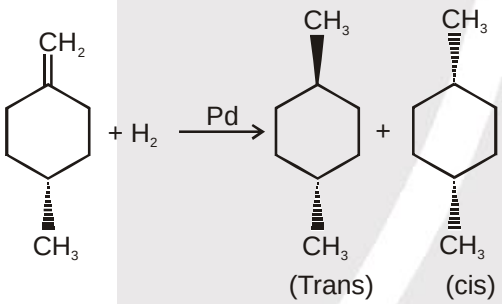
9. HIO_4 is a mild oxidising agent.

Cyclic intermediate is formed with vicinal diols.

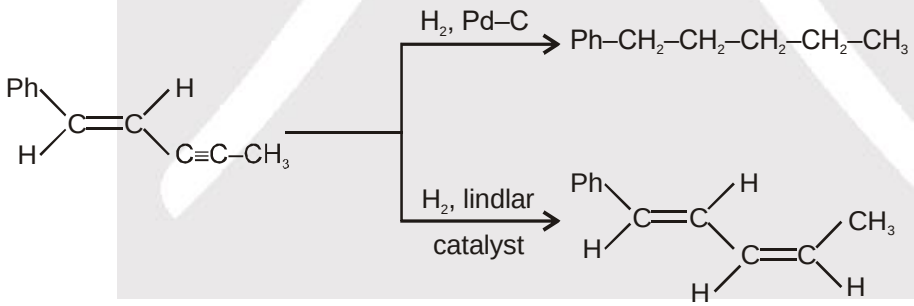
11.



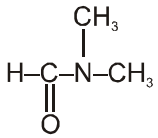
12.



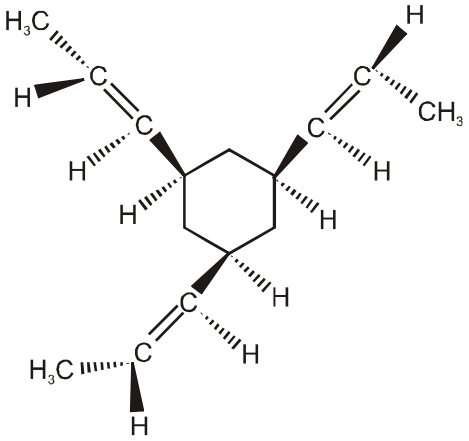
13.



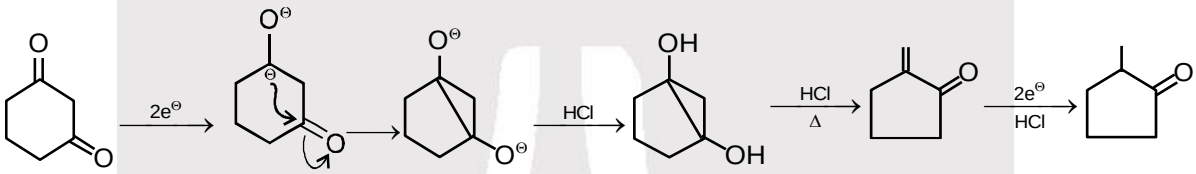
14.



m.w. is 73

15. (P) $\xrightarrow{Na/NH_3(\ell)}$ 

D.u. = X = 4 ; Y = 1

16. 

17.