

Preface

The idea of the book entitled “Organic Chemistry: SET PYQ’s” was born because of the lack of any comprehensive book covering previous year questions with detailed explanation for all states SET examination.

This book covers all PYQ’s with topic wise sorted question and solution:

1. Nomenclature,
2. General organic chemistry,
3. Stereochemistry,
4. Reaction Mechanism,
5. Name reaction,
6. Reagent,
7. Pericyclic reactions,
8. Photochemistry,
9. Spectroscopy,
10. Heterocyclic chemistry,
11. Natural Products.

The ultimate purpose of this book is to equip the reader with brainstorming challenges and solution for organic chemistry and applied aspect examinations. It contains predigested information on the entire academic subject of organic chemistry for good understanding, assimilation, self-evaluation, and reproducibility. Although we have made every effort to make the book error free, we are under no illusion. We welcome comments, criticism and suggestions from the readers to evolve the contents.

Acknowledgement

First of all I would like to thank our entire students at Institute for advanced Studies (IFAS), who have helped us to learn and practice both the art and science of chemistry. We would like to thank Er. Radheshyam Choudhary, Founding CEO, IfAS Edutech Pvt. Ltd. for being a continuous source of inspiration through his positive strokes.

We also want to thank Dr. Kailash Choudhary, Director at IFAS Publications, for his valuable support and critical suggestion for completion of the work.

Our special thanks to **Mr. Mohit Goyal, Mr. Ketan Mundkar, Mr. Tushar Kale, Mr. Arfaz Shaikh, and Mr. Sunil Madagyal** for their contribution to improve content of this book.

Our special thanks to **Mr. Hitesh Maurya and Mr. Souryaban sir** for reviewing and helping us for preparing the systematic layout, your comment were invaluable in improving the text. We could not have done this without their help and passion for chemistry.

Our special thanks **Mr. Rajiv Abhyankar** to motivating us.

We would not forget to thank all the IfAS team where we were able to further continue our teaching, training, and especially learning the many facets of the process of building these creative questions in books.

This book is a team effort, and producing it would be impossible without outstanding people of IFAS publication. It was pleasure to work with many others dedicated and creative people of IFAS during the production of this book. Special thanks for Vikendra Metha who crafted our ideas to wonderful design of cover page and Kuldeep Singh Rathore for formatting and type setting.

And finally, our humble greetings to all who put their significant efforts and are unmentioned.

INDEX
SET ORGANIC CHEMISTRY

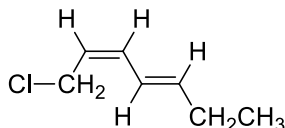
CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	NOMENCLATURE OF ORGANIC COMPOUNDS	1
2	GENERAL ORGANIC CHEMISTRY & AROMATICITY	17
3	STEREOCHEMISTRY	38
4	REACTION MECHANISM	67
5	NAME REACTION & REARRANGEMENT	118
6	REAGENTS IN ORGANIC SYNTHESIS	141
7	PERICYCLIC CHEMISTRY	206
8	PHOTOCHEMISTRY	232
9	SPECTROSCOPY	246
10	HETEROCYCLIC CHEMISTRY	277
11	NATURAL PRODUCTS	287

NOMENCLATURE OF ORGANIC COMPOUNDS

PREVIOUS YEAR EXAM QUESTIONS

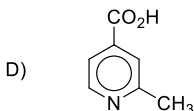
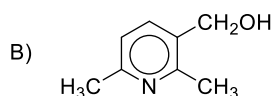
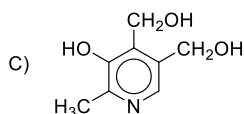
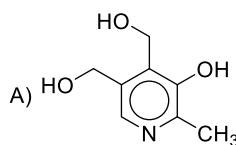
ANDHRA PRADESH SET

1. Give the IUPAC name for the given structure



- (A) 1-Chloro – 2Z,4Z – heptadiene
 (B) 1-Chloro – 2Z,4E – 2,4 – heptadiene
 (C) 7-Chloro – 2Z,4E – heptadiene
 (D) 1-Chloro – 2E,4Z – 2,4 – heptadiene

2. Identify pyridoxin from the following structures

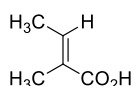


(2012)

3. Match the following: (Nomenclature)

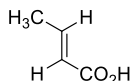
I) Maleic acid

1.



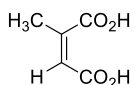
II) Citraconic acid

2.



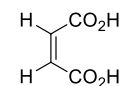
III) Crotonic acid

3.

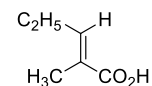


IV) Tiglic acid

4.

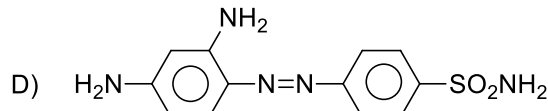
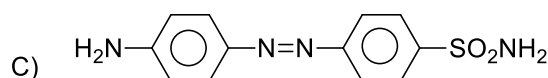
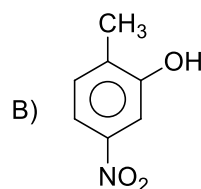
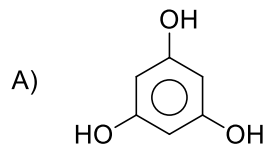


5.

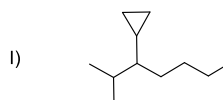


	I	II	III	IV
(A)	1	4	2	3
(B)	4	3	2	1
(C)	3	1	5	2
(D)	2	3	1	5

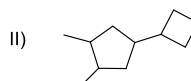
4. Identify prontosil from the following (Nomenclature)



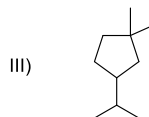
5. Match the following: (Nomenclature)



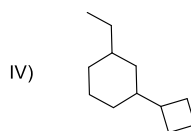
1. 1,1-Dimethyl-3- isopropyl cyclopentane



2. 1-Cyclobutyl-3- ethylcyclo- hexane



3. 4-cyclobutyl-1,2-dimethylcyclopentane



4. 3-cyclopropyl-2- methyl-heptane

	I	II	III	IV
(A)	1	3	2	4
(B)	4	1	2	3
(C)	5	2	3	4
(D)	4	3	1	2

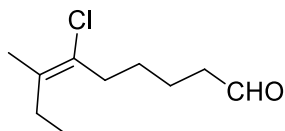
(2013)

6. Identify cinchoninic acid from the following structures

- A)
- B)
- C)
- D)

(2014)

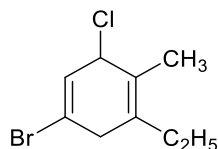
7. The correct name of the following compound is



- (A) 6-Chloro-7-methylnonanol
 (B) 6-chloro-7-methylnon-6-enal
 (C) 6-Chloro-7-methylnonenol
 (D) 6-Chloro-7-methylnonanal

(2019)

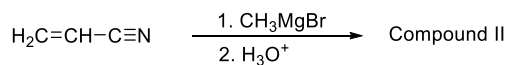
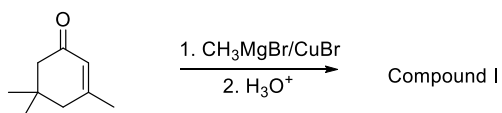
8. IUPAC name of



- (A) 5-Bromo-3-chloro-1-ethyl-2-methylcyclohex-1,4-diene
 (B) 4-Bromo-6-chloro-2-ethyl-1-methylcyclohex-1-ene
 (C) 1-Bromo-5-chloro-3-ethyl-4-methylcyclohex-3-ene
 (D) 5-Bromo-4-chloro-3-ethyl-2-methylcyclohex-2-ene

GUJARAT SET

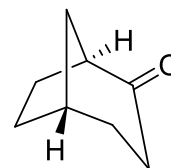
1. Predict the products in the following reactions:



- (A) and $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{COCH}_3$
 (B) and $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{C}\equiv\text{N}$

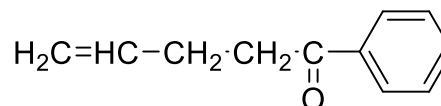
- (C) and $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$
 (D) and $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$

2. Propose correct IUPAC name for the following compound:



- (A) 1S, 5S-Bicyclo [3.2.1] octa-2-one
 (B) 1S, 5R-Bicyclo [3.2.1] octa-2-one
 (C) 1R, 5S-Bicyclo [3.2.1] octa-5-one
 (D) 1S, 5S-Bicyclo [3.2.1] octa-5-one

3. The IUPAC name of the following molecule is

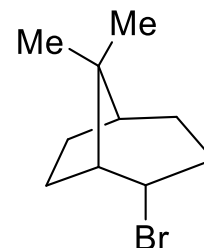


- (A) Phenylbutenylketone
 (B) 5-phenyl-5-oxo-1-pentene
 (C) 1-phenylpenta-4-en-1-one
 (D) 1-phenyl-2-oxo-4-pentene

4. The IUPAC name of $\text{Li}[\text{AlH}_4]$ is:

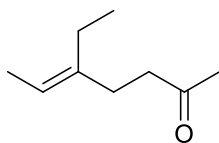
- (A) Lithium tetrahydridoaluminate (III)
 (B) Lithium tetrahydridoaluminium (III)
 (C) Lithium tetrahydridoaluminium
 (D) Lithium tetrahydroaluminate (III)

5. The IUPAC name of the following molecule is:



- (A) 2-bromo-6, 6-dimethylbicyclo [3.2.1] octane
 (B) 1, 1-dimethyl-3-bromobicyclo [1.2.3] octane
 (C) 2-bromo-8, 8-dimethylbicyclo [3.2.1] octane
 (D) 5-bromo-8, 8-dimethylbicyclo [3.2.1] octane

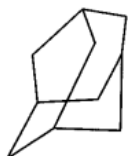
6. The IUPAC name of the following compound is:



- (A) (Z)-3-Ethylhept-2-en-6-one
 (B) (E)-3-Ethylhept-2-en-6-one
 (C) (Z)-5-Ethylhept-5-en-2-one
 (D) (E)-5-Ethylhept-5-en-2-one

(2023: Set 2)

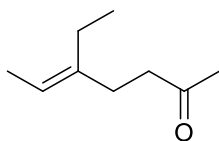
7. The correct IUPAC name for the following structure is



- (A) Tetracyclo [2.2.2.1^{3.5}1^{4.8}] decane
 (B) Tetracyclo [3.2.2.1^{4.8}] decane
 (C) Tricyclo[3.3.1.1^{3.7}] decane
 (D) Tricyclo[3.2.2.1^{4.8}] decane

(2014)

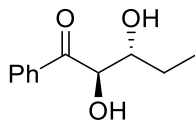
8. The IUPAC name of the following compound is:



- (A) (Z)-3-Ethylhept-2-en-6-one
 (B) (E)-3-Ethylhept-2-en-6-one
 (C) (Z)-5-Ethylhept-5-en-2-one
 (D) (E)-5-Ethylhept-5-en-2-one

(2016)

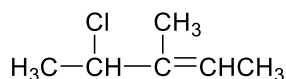
9. The IUPAC name of the following molecule is:



- (A) (2S, 3R)-1-Phenyl-pentan-1-one
 (B) (2R, 3R)-2,3-dihydroxy-1-phenylpentan-1-one
 (C) (2S, 3S)-1-Phenyl-pentan-1-one
 (D) (2R, 3R)-1-Phenyl-pentan-1-one

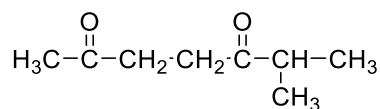
(2017)

10. Which is the correct IUPAC name of the following compound?



- (A) 2-chloro-3-methylpent-3-ene
 (B) 4-chloro-3-methylpent-2-ene
 (C) 3-methyl-4-chloropent-2-ene
 (D) 3-methyl-2-chloropent-3-ene

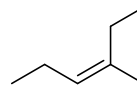
11. The IUPAC name of the following compound is:



- (A) 6-Methylheptane-2, 5-dione
 (B) 2-Methylheptane-3, 6-dione
 (C) 6-Methyl-2, 5-dioxoheptane
 (D) 2-Methyl-3, 6-dioxoheptane

(2019)

12. The correct IUPAC name of the following compound is:



- (A) 4-Ethylpent-3-ene
 (B) 2-Ethylpent-2-ene
 (C) 3-Methylhex-3-ene
 (D) 4-Methylhex-3-ene

(2019)

13. The structure of the following compound is:

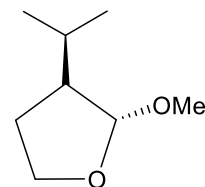
(z)-2-(chloromethyl) but-2-enoic acid

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

HIMACHAL PRADESH SET

(2014)

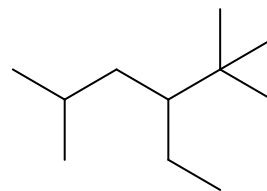
1. IUPAC name of the following compound is:-



- (A) (3R)-isopropyl-(2S)-methoxy-tetrahydrofuran
 (B) (2R,3S)-3-isopropyl-2-methoxytetrahydrofuran
 (C) (3R)-isopropyl-(2R)-methoxy-tetrahydrofuran
 (D) (3S)-isopropyl-(2S)-methoxy-tetrahydrofuran

(2017)

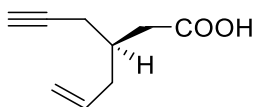
2. IUPAC name of the following compound is:-



- (A) 3-Ethyl-2, 2, 5-trimethyl hexane
 (B) 3-tert-butyl-5-methyl hexane
 (C) 4-Ethyl-2, 5, 5-trimethyl hexane
 (D) 2, 2, 5-trimethyl-4-Ethyl hexane

(2018)

3. The IUPAC name of the following compound is:

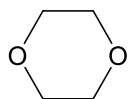


- (A) (R)-3-(prop-2-enyl)hex-5-ynoic acid
 (B) (S)-3-(prop-2-enyl)hex-5-ynoic acid
 (C) (R)-3-(prop-2-enyl)hex-5-enoic acid
 (D) (S)-3-(prop-2-yn-1-yl)hex-5-enoic acid

KARNATAKA SET

(2013)

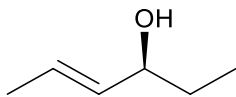
1. The IUPAC name of the following compound is:-



- (A) Dioxane
 (B) 1,4-Dioxane
 (C) Diethylene-1, 4-dioxane
 (D) 1,4-dioxacyclohexane

(2014)

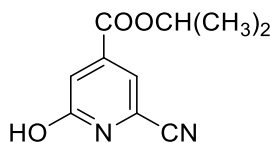
2. IUPAC name of the following compound is:-



- (A) (E, 4S) – Hept – 5 – en – 4 – ol
 (B) (E, 4S)-hex-4-en-3-ol
 (C) (E, 4R) – Hept – 5 – en – 4 – ol
 (D) (E, 4R) – Hept – 2 – en – 4 – ol

(2014)

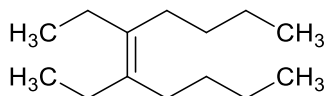
3. The IUPAC name of the compound is



- (A) Isopropyl 2-cyano-6- hydroxypyridine-4-carboxylate
 (B) Isopropyl 6-cyano-2- hydroxypyridine-4-carboxylate
 (C) Isopropyl 3-cyano-5-hydroxypyridine carboxylate
 (D) Isopropyl-3-hydroxy-5- cyanopyridine carboxylate

(2015)

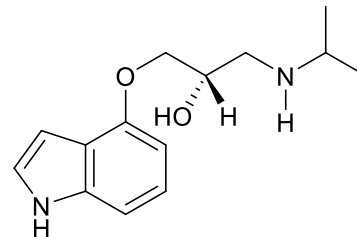
4. The IUPAC name of:-



- (A) 5, 6-diethyldeca -5-ene
 (B) 3,4-dibutyl hex - 3 - ene
 (C) 3-butyl - 4 - ethyl- oct-3-ene
 (D) 6-butyl-5-ethyl- oct-5-ene

(2015)

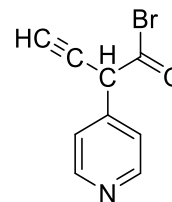
5. The IUPAC name of the compound having following structure is:-



- (A) (S)-1-((1H-indol-4-yl)oxy)-3-(isopropylamino)propan-2-ol
 (B) R-1-((1H - indol-4-yl) oxy) -3 - (isopropyl - amino) - propan-2-ol
 (C) S-3-((1H - indol-4-yl) oxy)-1-(isopropyl- amino) - propan-2-ol
 (D) R-3-((1H-indol-4-yl)oxy)-1-(isopropyl - amino) - propan-2-ol

(2017)

6. The IUPAC name of the following compound is:-

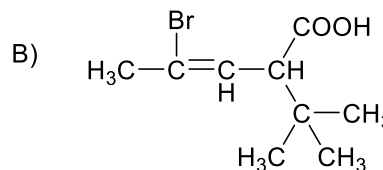
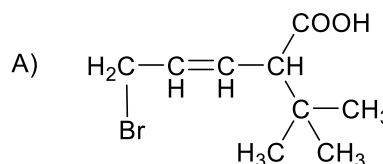


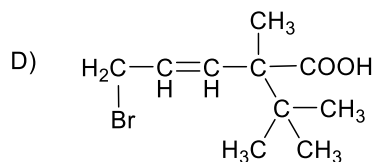
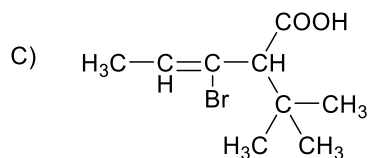
- (A) 2-(4-Pyridyl) but - 3ynoyl bromide
 (B) 1-(4-Pyridyl) but-1-yn-4-oyl bromide
 (C) 2-(4-Pyridyl) but-2-oyl bromide
 (D) 3-(4-Pyridyl) but-3-oyl bromide

(2017)

7. Choose the correct structure for the following Nomenclature.

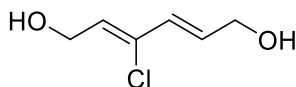
5-bromo-2-(tert-butyl)pent-3-enoic acid





(2018)

8. The IUPAC name of the following compound is



- (A) 2E,4E-3-chlorohex-2,4-diene-1,6-diol
 (B) 2Z,4E-3-chlorohex-2,4-diene-1,6-diol
 (C) 2Z,4Z-4-chlorohex-2,4-diene-1,6-diol
 (D) 2E,4Z-4-chlorohex-2,4-diene-1,6-diol

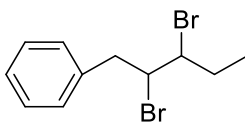
(2020)

9. The IUPAC name of camphor is

- (A) 6-oxo-1,2,2-Trimethylbicyclo[2,2,1] heptane
 (B) 1,7,7-Trimethylbicyclo[2,2,1] heptane-2-one
 (C) 1,5,5-Trimethylbicyclo[2,2,1] heptane-2-one
 (D) 1,7,7-Trimethylbicyclo[2,1,2] heptane-2-one

(2020)

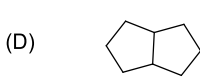
10. The IUPAC name of the following compound is:



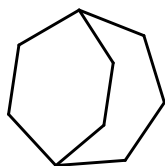
- (A) 2,3-Dibromo pentyl benzene
 (B) 5-phenyl-3,4-dibromopentane
 (C) 2,3-Dibromo-1-phenylpentane
 (D) 1-phenyl-2,3-dibromopentane

(2020)

11. Identify the correct structure of bicyclo [2,2,2] octane

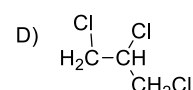
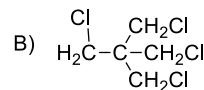
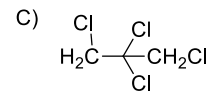
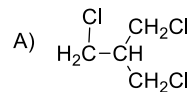


12. The IUPAC name of the following molecule is:-



- (A) Bicyclo [2.2.2] octane
 (B) Bicyclo [2.2.3] octane
 (C) Bicyclo [3.2.1] heptane
 (D) Bicyclo [3.2.2] nonane

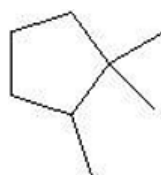
13. The structure of the compound 1, 3-dichloro-2, 2-bis (chloromethyl) propane



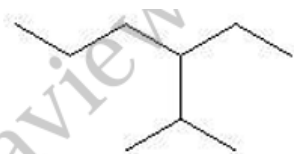
MADHYA PRADESH SET

(2018)

1. The IUPAC name of the following compounds are



and

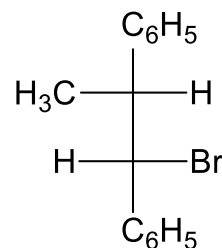


- (A) 1,1,2-Trimethylcyclopentane and 3-(1-Methylethyl)hexane
 (B) 1,1,2-Trimethylcyclopentane and 3-Ethyl-2-methylhexane
 (C) 1,2,2-Trimethylcyclopentane and 3-Ethyl-2-methylhexane
 (D) 1,2,2-Trimethylcyclopentane and 3-(1-Methylethyl)hexane

MAHARASHTRA SET

(2013)

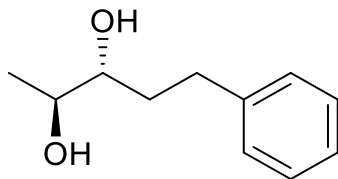
1. The IUPAC name of the following compound is:



- (A) Threo-2-bromo-1,2-diphenylpropane
 (B) Erythro-1-bromo-1,2-diphenylpropane
 (C) Threo-1-bromo-1,2-diphenylpropane
 (D) Erythro-2-bromo-1,2-diphenylpropane

(2013)

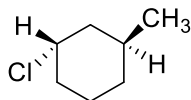
2. The correct IUPAC nomenclature of the following compound is :



- (A) (2S, 3R)—5—Phenylpentane-2, 3-diol
 (B) (3S, 4R)—1—Phenylpentane-3, 4-diol
 (C) (2R, 3S)—5—Phenylpentane-2, 3-diol
 (D) (3R, 4S)—1—Phenylpentane-3, 4-diol

(2015)

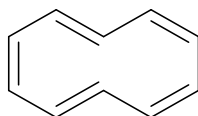
3. The correct IUPAC name of the following compound is



- (A) (1R, 3R)-1-chloro-3-methylcyclohexane
 (B) (1R, 3S)-1-chloro-3-methylcyclohexane
 (C) (1S, 3S)-1-chloro-3-methylcyclohexane
 (D) (1S, 3R)-1-chloro-3-methylcyclohexane

(2015)

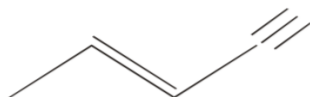
4. The correct IUPAC nomenclature for the following compound is:



- (A) 10-[5]-annulene (B) 10-[10]-annulene
 (C) 10-[18]-annulene (D) 10-[20]-annulene

(2015)

5. The correct IUPAC nomenclature for the following compound is:



- (A) (E) Pent-2-en-4-yne (B) (E) Pent-1-yne-3-ene
 (C) (E) Pent-4-yne-2-ene (D) (E) Pent-3-en-1-yne

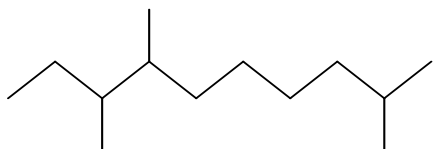
(2015)

6. The chemical abbreviation of DDT is one of the following:

- (A) p -dichlorodiphenyl trichloroethane
 (B) p -dichlorodiphenyl tetrachloroethane
 (C) p -dichlorodiphenyl trichloropropane
 (D) p -dichlorodiphenyl Tetrachlorobutane

(2016)

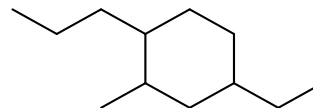
7. The correct IUPAC nomenclature of the following compound is:



- (A) 3, 4, 9-trimethyl decane
 (B) 2, 7, 8-trimethydecane
 (C) isotetradecane
 (D) 7-methyl-2-(1-methylpropyl) octane

(2017)

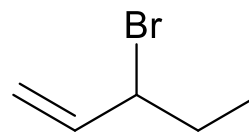
8. The correct IUPAC nomenclature of the following compound is:



- (A) 4-Ethyl-2-methyl-1-propylcyclohexane
 (B) 1-Ethyl-3-methyl-4-propylcyclohexane
 (C) 5-Ethyl-1-methyl-2-propylcyclohexane
 (D) 3-Ethyl-1-methyl-6-propylcyclohexane

(2017)

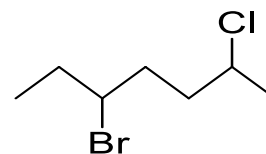
9. The correct IUPAC nomenclature of the following compound is



- (A) 3-Bromopent-4-ene
 (B) 3-Bromopent-1-ene
 (C) 1-Bromo-1-ethylprop-2-ene
 (D) Ethyl vinyl bromomethane

(2018)

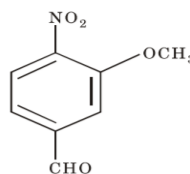
10. The correct IUPAC nomenclature of the following compound is



- (A) 5-Bromo-2-chloroheptane
 (B) 2-chloro-5-bromoheptane
 (C) 3-Bromo-6-chloroheptane
 (D) 6-chloro-3-bromoheptane

(2018)

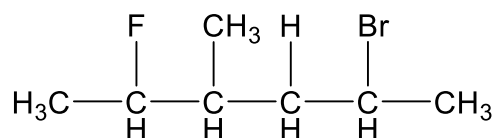
11. The correct IUPAC nomenclature of the following compound is:



- (A) 2-Nitro-5-carbaldehydo anisole
 (B) 2-Methoxy-4-carbaldehydo nitrobenzene
 (C) 4-Nitro-5-methoxy benzaldehyde
 (D) 3-Methoxy-4-nitro benzaldehyde

(2020)

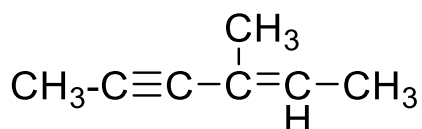
12. The correct IUPAC name of the following compound is:



- (A) 2-fluoro-5-bromo-3-methylhexane
 (B) 5-bromo-2-fluoro-3-methylhexane
 (C) 2-bromo-5-fluoro-4-methylhexane
 (D) 5-fluoro-2-bromo-5-methylhexane

(2021)

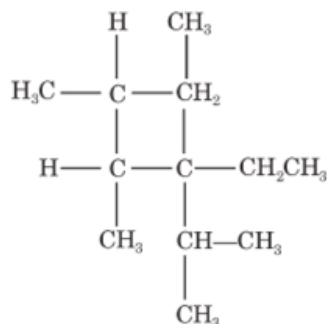
13. The correct IUPAC name of the following compound is:



- (A) 4-Methyl-4-hexen-2-yne
 (B) 4-Methyl-2-hexen-4-yne
 (C) 3-Methyl-4-hexen-2-yne
 (D) 3-methylhex-2-en-4-yne

(2023)

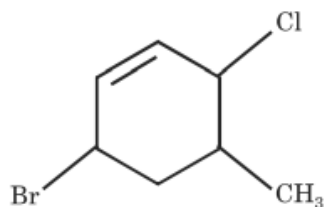
14. The IUPAC name of the following compound is:



- (A) 3-Ethyl-2, 4, 5-trimethyl heptane
 (B) 5-Ethyl-3, 4, 6-trimethyl heptane
 (C) 3-isopropyl-4, 5-dimethyl heptane
 (D) 5-isopropyl-3, 4-dimethyl heptane

(2024)

15. The IUPAC name of the following compound is:

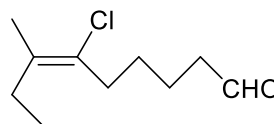


- (A) 6-Bromo – 3-chloro – 4-methyl cyclohexene
 (B) 3-Bromo – 6-chloro – 5-methyl cyclohexene
 (C) 1-Bromo – 4-chloro – 5-methyl cyclohex – 2-ene
 (D) 4-Bromo – 1-chloro – 6-methyl cyclohex – 2-ene

TELANGANA SET

(2014)

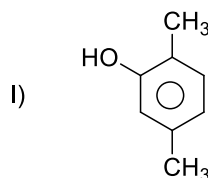
1. The correct name of the following compound is



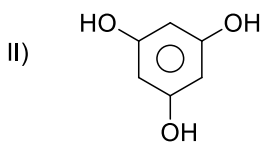
- (A) 6-Chloro-7-methylnonanol
 (B) 6-chloro-7-methylnon-6-enal
 (C) 6-Chloro-7-methylnonenol
 (D) 6-Chloro-7-methylnonanal

(2014)

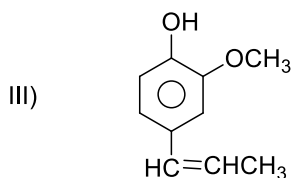
2. Match the following:



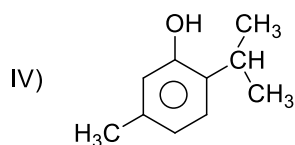
1. Phloroglucinol



2. PXylenol



3. Thymol

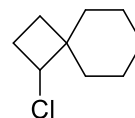


4. Isoeugenol

	I	II	III	IV
(A)	1	3	2	4
(B)	2	1	4	3
(C)	3	4	2	1
(D)	1	4	3	2

(2017)

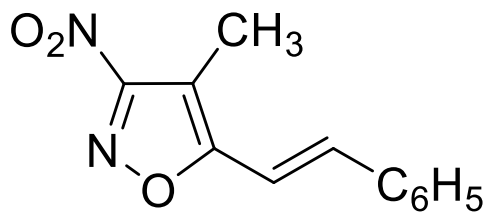
3. The correct name of the following compound is:



- (A) 1-chloro spiro- [3, 5] – nonane
 (B) 3-chloro spiro- [5, 3] – nonane
 (C) 6-chloro spiro- [5, 3] – nonane
 (D) 4-chloro spiro- [5, 3] – nonane

(2017)

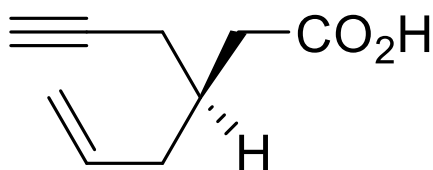
4. The correct nomenclature of the following compound is:



- (A) 3-Nitro-4-Methyl-5-Styryl oxazole
 (B) 4-methyl-3-nitro-5-styrylisoxazole
 (C) 3-Nitro-4-Methyl-5-Styryl pyrazole
 (D) 4-Styryl-2-Nitro-3-Methyl isoxazole

(2018)

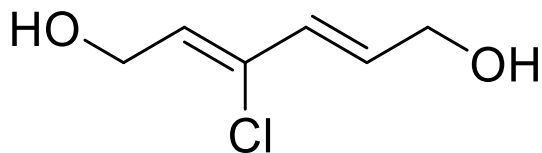
5. The IUPAC name of the following compound is



- (A) (R)-3-(prop-2-enyl) hex-5-ynoic acid
 (B) (R)-3-(prop-2-enyl) hex-5-enoic acid
 (C) (S)-3-(prop-2-ynyl) hex-5-enoic acid
 (D) (S)-3-(prop-2-enyl) hex-5-ynoic acid

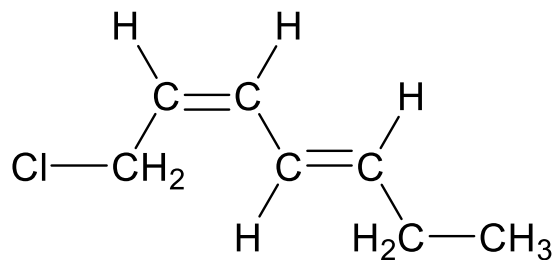
(2018)

6. The IUPAC nomenclature of the following compound is



- (A) (2E, 4E)-3-chlorohexa-2, 4-diene-1, 6-diol
 (B) (2Z, 4E)-3-chlorohexa-2, 4-diene-1, 6-diol
 (C) (2Z, 4Z)-3-chlorohexa-2, 4-diene-1, 6-diol
 (D) (2E, 4Z)-3-chlorohexa-2, 4-diene-1, 6-diol

7. Give the IUPAC name for the given structure

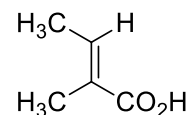


- (A) 1-Chloro - 2Z,4Z - heptadiene
 (B) 1-Chloro - 2Z,4E - 2,4 - heptadiene
 (C) 7-Chloro - 2Z,4E - heptadiene
 (D) 1-Chloro - 2E,4Z - 2,4 - heptadiene

8. Match the following:

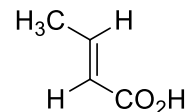
I) Maleic acid

1.



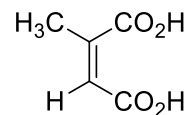
II) Citraconic acid

2.



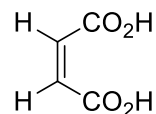
III) Crotonic acid

3.

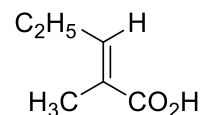


IV) Tiglic acid

4.

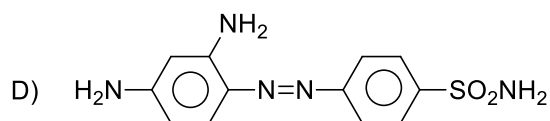
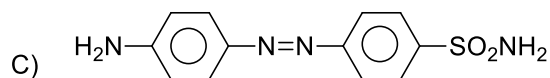
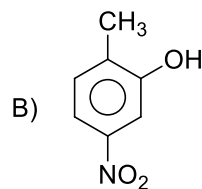
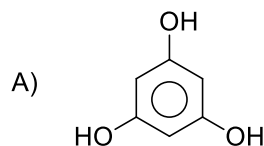


5.

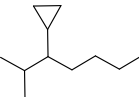
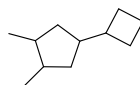
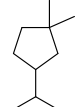
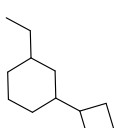


	I	II	III	IV
(A)	1	4	2	3
(B)	4	3	2	1
(C)	3	1	5	2
(D)	2	3	1	5

9. Identify prontosil from the following



10. Match the following:

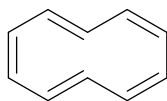
- I)  1. 1,1-Dimethyl-3- isopropyl cyclopentane
- II)  2. 1-Cyclobutyl-3- ethylcyclo-hexane
- III)  3. 1,1,1,2,3- Tetramethylcyclobutane
- IV)  4. 3-cyclopropyl-2- methyl-heptane
- 5) 4-cyclobutyl-1,2-dimethylcyclopentane

I	II	III	IV
(A) 1	3	2	4
(B) 4	1	2	3
(C) 5	2	3	4
(D) 4	5	1	2

WEST BENGAL SET

(2015)

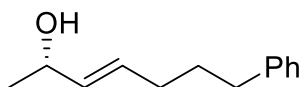
1. The correct IUPAC nomenclature for the following compound is



- (A) 10 – [5] – annulene (B) 10 – [10] - annulene
(C) 10 – [18] – annulene (D) 10 – [20] – annulene

(2017)

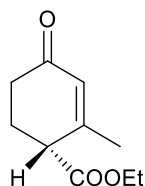
2. The IUPAC name for the compound given below is:



- (A) (2R,3Z) – 7 – phenylhept – 3 en – 2 – o1
(B) (2S,3Z) – 7 – phenylhept – 3 en – 2 – o1
(C) (2R,3E) – 7 – phenylhept – 3 en – 2 – o1
(D) (2S,3E) – 7 – phenylhept – 3 en – 2 – o1

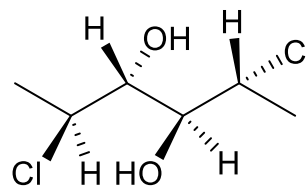
(2018)

3. The IUPAC name of the following compound is



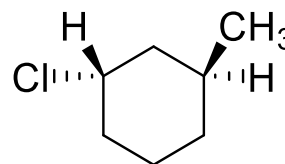
- (A) ethyl (S)-2- methyl-4- oxocyclohex-2-enecarboxylate
(B) ethyl (R) -2- methyl-4- oxocyclohex-2- enecarboxylate
(C) (R) -4- ethoxycarbonyl-3- methylcyclohex-2-enone
(D) (S)-4- ethoxycarbonyl-3-methylcyclohex-2-enone

4. The IUPAC name of the following compound is



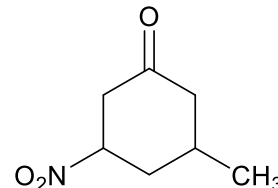
- (A) (2S, 3R, 4S, 5R)–2, 5–dichlorohexane – 3, 4-diol
(B) (2S, 3S, 4S, 5R)–2, 5–dichlorohexane – 3, 4-diol
(C) (2R, 3S, 4R, 5S)–2,5-dichlorohexane-3,4-diol
(D) (2S, 3R, 4R, 5S)–2, 5–dichlorohexane – 3, 4-diol

5. The correct IUPAC name of the following compound is



- (A) (1R, 3R)-1-chloro-3-methylcyclohexane
(B) (1R, 3S)-1-chloro-3-methylcyclohexane
(C) (1S, 3R)-1-chloro-3-methylcyclohexane
(D) (1S, 3S)-1-chloro-3-methylcyclohexane.

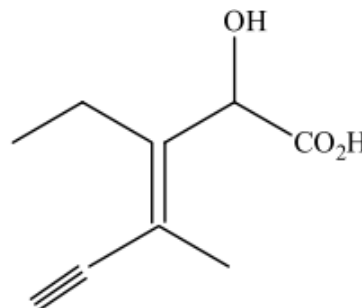
6. The IUPAC name of the following compound is



- (A) 3-methyl-5-nitrocyclohexan-1-one
(B) 5-methyl-3-nitrocyclohexanone
(C) 3-methyl-5-nitro-1-oxocyclohexane
(D) 5-methyl-3-nitro-1-oxocyclohexane

(2023: 2 Mark)

7. The IUPAC name for the compound given below is



- (A) 3-Ethyl-2-hydroxy-4-methylhex-3- en-5-ynoic acid
(B) 3-Ethyl-4-methyl-2-hydroxyhex-3- en-5-ynoic acid
(C) 4-Methyl-3-ethyl-2-hydroxyhex-3- en-5-ynoic acid
(D) 2-Hydroxy-3-ethyl-4-methylhex-3- en-5-ynoic acid

ANSWER KEY

ANDHRA PRADESH

1	2	3	4	5	6	7	8
B	C	B	D	D	B	B	A

GUJARAT

1	2	3	4	5	6	7	8	9	10
A	A	C	A	C	D	C	D	B	B

11	12	13
A	C	B

HIMACHAL PRADESH

1	2	3
B	A	D

KARNATAKA

1	2	3	4	5	6	7	8	9	10
B	B	A	A	A	A	A	B	B	A

11	12	13
A	D	B

MADHYA PRADESH

1
B

MAHARASHTRA

1	2	3	4	5	6	7	8	9	10
C	A	C	B	D	A	B	A	B	A

11	12	13	14	15
D	A	D	A	A

TELANGANA

1	2	3	4	5	6	7	8	9	10
B	B	A	B	C	B	B	B	D	D

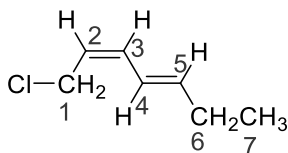
WEST BENGAL

1	2	3	4	5	6	7
B	D	B	C	D	A	A

SOLUTIONS

ANDHRA PRADESH SET

1. Solution: (B)



1st number goes to those carbon where substituent attached and for E,Z nomenclature if same priority group on same side, then we can say Z isomer and if same priority group on opposite side, then we can say E isomer

and priority of the atom given on the basis of atomic number

Hence, Correct option is (B).

2. Solution: (C)

Hence, Correct option is (C).

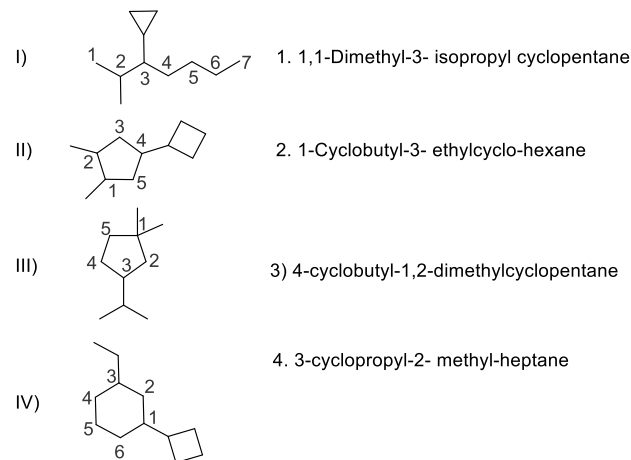
3. Solution: (B)

Hence, Correct option is (B).

4. Solution: (D)

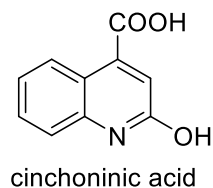
Hence, Correct option is (D).

5. Solution: (D)



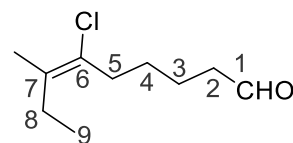
Hence, Correct option is (D).

6. Solution: (B)



Hence, Correct option is (B).

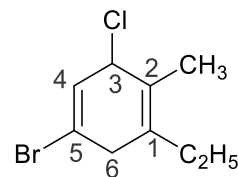
7. Solution: (B)



1st priority goes to aldehyde

Hence, Correct option is (B).

8. Solution: (A)



1st number gives to those carbon where ethyl and alkene attached

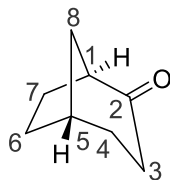
Hence, Correct option is (A).

GUJARAT SET

1. Solution: (A)

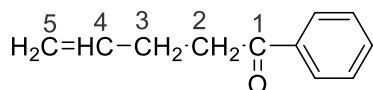
Hence, Correct option is (A).

2. Solution: (A)



Number starting from near to carbonyl carbon. R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane) numbering start from near to functional group
Hence, Correct option is (A).

3. Solution: (C)

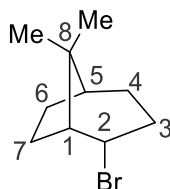


Numbering starting from carbonyl carbon
Hence, Correct option is (C).

4. Solution: (A)

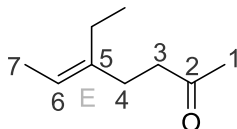
Hence, Correct option is (A).

5. Solution: (C)



Hence, Correct option is (C).

6. Solution: (D)



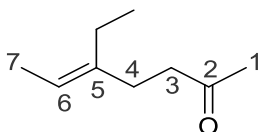
(E)-5-Ethylhept-5-en-2-one

Hence, Correct option is (D).

7. Solution: (C)

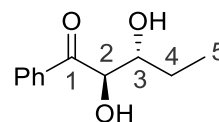
Hence, Correct option is (C).

8. Solution: (D)



Numbering starting from near to carbonyl carbon
Hence, Correct option is (D).

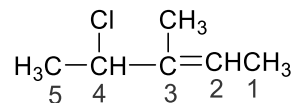
9. Solution: (B)



Numbering starting from carbonyl carbon. If the same atom are opposite side then we called threo isomer.

Hence, Correct option is (B).

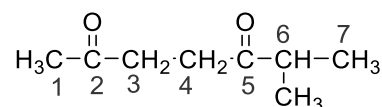
10. Solution: (B)



Numbering starting from near to alkene carbon

Hence, Correct option is (B).

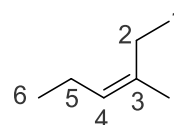
11. Solution: (A)



Number starting from near to carbonyl carbon

Hence, Correct option is (A).

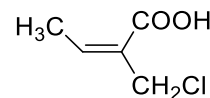
12. Solution: (C)



Numbering starting from those carbon where methyl and double bond should near

Hence, Correct option is (C).

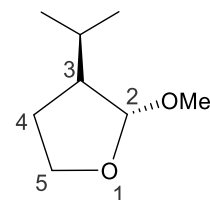
13. Solution: (B)



Hence, Correct option is (B).

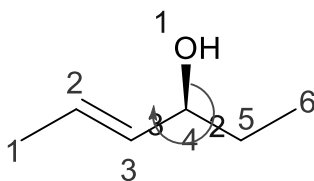
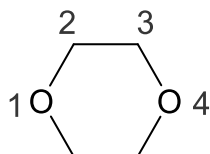
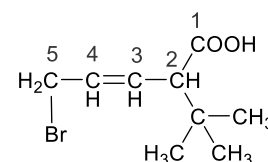
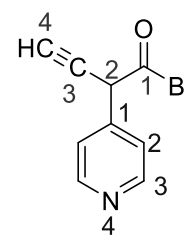
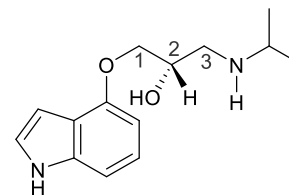
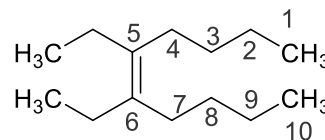
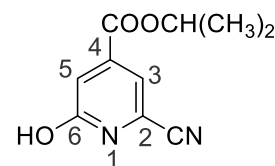
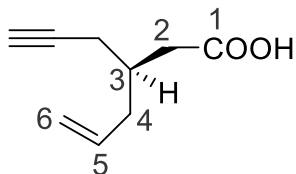
HIMACHAL PRADESH SET

1. Solution: (B)



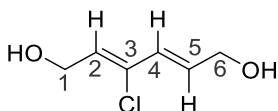
R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane) and numbering start from oxygen
Hence, Correct option is (B).

A skeletal structure of 3-ethyl-2,3,5-trimethylhexane. The main chain is a hexane, numbered 1 to 6 from right to left. Substituents include a methyl group on carbon 2, an ethyl group on carbon 3, and methyl groups on carbons 5 and 6.



IFAS Publications

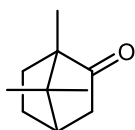
8. Solution: (B)



Numbering starting from those carbon where chlorine should near and for E, Z nomenclature if same priority group on same side, then we can say Z isomer and if same priority group on opposite side, then we can say E isomer and priority of the atom given on the basis of atomic number

Hence, Correct option is (B).

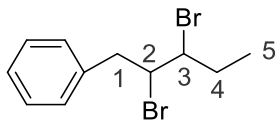
9. Solution: (B)



Numbering starting from near to ketone where substituent attach

Hence, Correct option is (B).

10. Solution: (A)

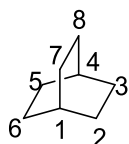


Numbering starting from those carbon where benzene group attached

Hence, Correct option is (A).

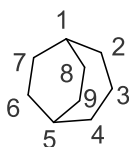
11. Solution: (A)

Structure of bicyclo [2, 2, 2] octane is



Hence, Correct option is (A).

12. Solution: (D)

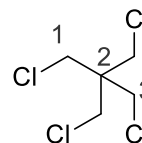


1st number goes to tertiary carbon and in bicyclic compound number starting from more membered ring to less numbered ring

Hence, Correct option is (A).

13. Solution: (B)

Structure of the compound 1,3-dichloro-2, 2-bis (chloromethyl) propane is



Hence, Correct option is (B).

MADHYA PRADESH SET

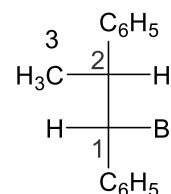
1. Solution: (B)

Correct Answer is 1,1,2-Trimethylcyclopentane and 3-Ethyl-2-methylhexane

Hence, Correct option is (B).

MAHARASHTRA SET

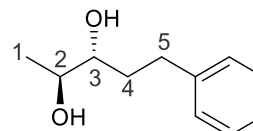
1. Solution: (C)



1st no. goes to halogenated carbon and If the same atom are opposite side then we called threo isomer

Hence, Correct option is (C).

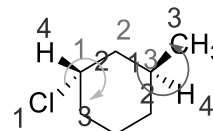
2. Solution: (A)



Numbering has been given from nearest substituent side and R,S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane)

Hence, Correct option is (A).

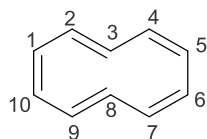
3. Solution: (C)



1st number goes to halogenated carbon. And according to CIP rule 1st priority goes to highest atomic number atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane)

Hence, Correct option is (C).

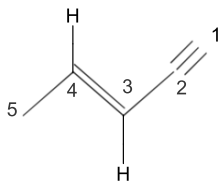
4. Solution: (B)



10 carbo and 10 electron so correct answer is 10-[10]-annulene

Hence, Correct option is (B).

5. Solution: (D)

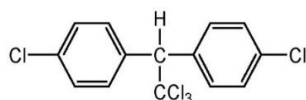


If two same group are opposite side then we can say trans(E) and numbering has been given to alkene first

Hence, Correct option is (D).

6. Solution: (A)

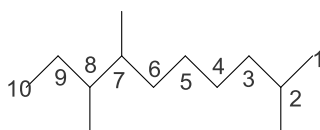
DDT means



p -Dichlorodiphenyl trichloroethane with IUPAC name 4,4'-(2,2,2-trichloroethane-1,1-diyl)bis(chlorobenzene)

Hence, Correct option is (A).

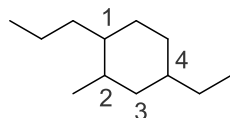
7. Solution: (B)



First select long chain then numbering give from nearest substituent and numbering give alphabetically

Hence, Correct option is (B).

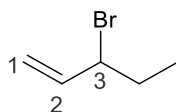
8. Solution: (A)



Numbering has been given from that side where substituent are near and numbering of substituent through alphabetically

Hence, Correct option is (A).

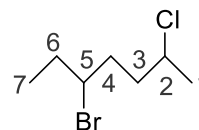
9. Solution: (B)



1st priority goes to alkene functional group and numbering gives through alphabetically

Hence, Correct option is (B).

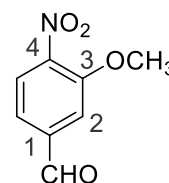
10. Solution: (A)



Numbering give from this side where attachment of substituent should be nearest and priority of substituent through alphabetically

Hence, Correct option is (A).

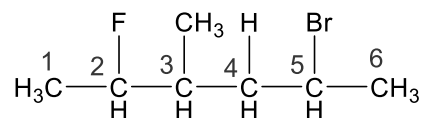
11. Solution: (D)



In this example 1st numbering goes to aldehyde and then goes to nearest substituent and naming of substituent through alphabetically

Hence, Correct option is (D).

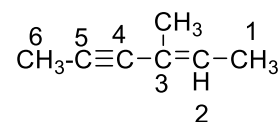
12. Solution: (A)



Numbering give from this side where attachment of substituent should be nearest (CH₃ at 3) and naming of substituent gives alphabetically

Hence, Correct option is (A).

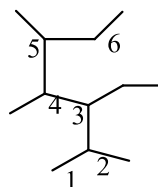
13. Solution: (D)



Priority of alkene is more than alkyne.

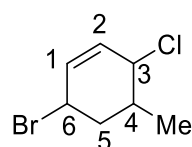
Hence, Correct option is (D).

14. Solution: (A)



Hence, Correct option is (A).

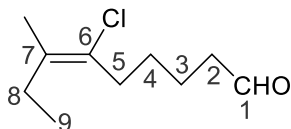
15. Solution: (A)



Hence, Correct option is (A).

TELANGANA SET

1. Solution: (B)

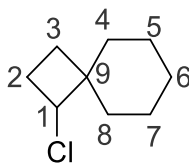


1st number goes to aldehyde and naming of substituent according to alphabetically order
Hence, Correct option is (B).

2. Solution: (B)

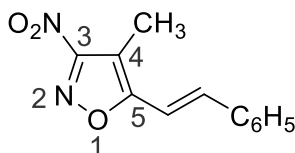
Hence, Correct option is (B).

3. Solution: (A)



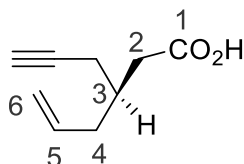
1st number goes to these carbon where chlorine attached and in spiro compound numbering start from less membered ring to more membered ring
Hence, Correct option is (A).

4. Solution: (B)



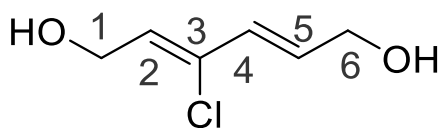
Hence, Correct option is (B).

5. Solution: (C)



1st number goes to carboxylic acid and R,S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane)
Hence, Correct option is (C).

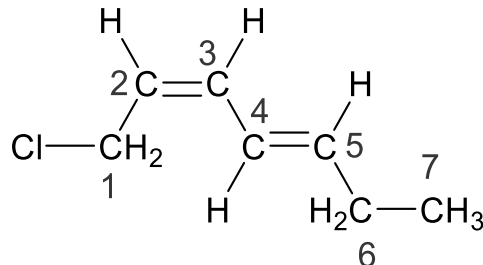
6. Solution: (B)



1st number goes to that carbon where nearest substituent will come and E, Z nomenclature if same priority group on same side, then we can say Z isomer and if same priority

group on opposite side, then we can say E isomer and priority of the atom given on the basis of atomic number
Hence, Correct option is (B).

7. Solution: (B)



1st number goes to those carbon where substituent attached and for E,Z nomenclature if same priority group on same side, then we can say Z isomer and if same priority group on opposite side, then we can say E isomer and priority of the atom given on the basis of atomic number

Hence, Correct option is (B).

8. Solution: (B)

Hence, Correct option is (B).

9. Solution: (D)

Hence, Correct option is (D).

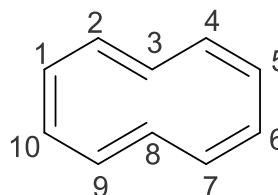
10. Solution: (D)

- I) 1. 1,1-Dimethyl-3- isopropyl cyclopentane
- II) 2. 1-Cyclobutyl-3- ethylcyclo- hexane
- III) 3. 1,1,2,3- Tetramethylcyclobutane
- IV) 4. 3-cyclopropyl-2- methyl-heptane
- 5) 5) 4-cyclobutyl-1,2-dimethylcyclopentane

Hence, Correct option is (D).

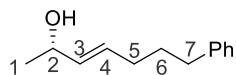
WEST BENGAL SET

1. Solutions: (B)



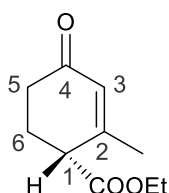
10 carbo and 10 electron

Hence, Correct option is (B).

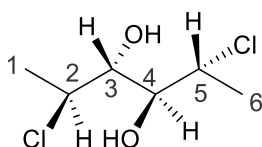
2. Solutions: (D)

Numbering starting from these carbon where substituent should near and R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane) and for E, Z nomenclature if same priority group on opposite side then we can say E isomer

Hence, Correct option is (D).

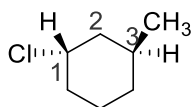
3. Solutions: (B)

R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane) and numbering start from near to substituent
Hence, Correct option is (B).

4. Solutions: (C)

R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction give S (for that lowest priority group should be below the plane)

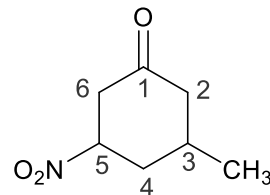
Hence, Correct option is (C).

5. Solutions: (D)

R, S nomenclature according to CIP rule 1st priority goes to highest atomic no. atom and then accordingly then for clockwise direction gives R (for that lowest priority group should be below the plane) and for anticlockwise direction

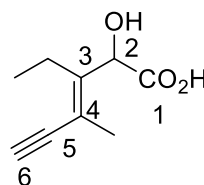
give S (for that lowest priority group should be below the plane)

Hence, Correct option is (D).

6. Solutions: (A)

1st number goes to carbonyl group

Hence, Correct option is (A).

7. Solution: (A)

Hence, Correct option is (A).

GENERAL ORGANIC CHEMISTRY & AROMATICITY

PREVIOUS YEAR EXAM QUESTIONS

ANDHRA PRADESH SET

(2012)

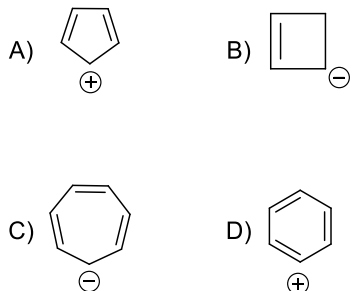
1. According to HSAB Theory

- I. Hard species have large HOMO-LUMO gap
- II. Hard species have small HOMO-LUMO gap
- III. Soft species have large HOMO-LUMO gap
- IV. Soft species have small HOMO-LUMO gap

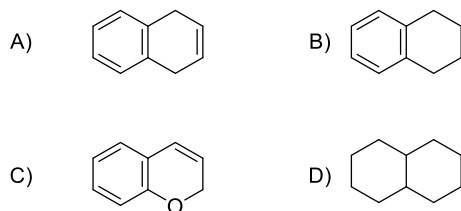
The correct combination is

- (A) I, II (B) II, IV
(C) II, III (D) I, IV

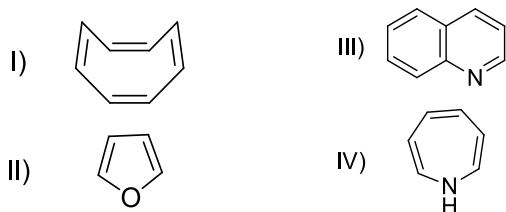
2. Identify the aromatic compound.



3. The isoelectronic compound with naphthalene is



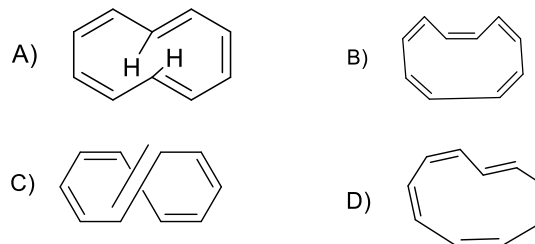
4. Non-aromatic compounds among the following



The correct combination is

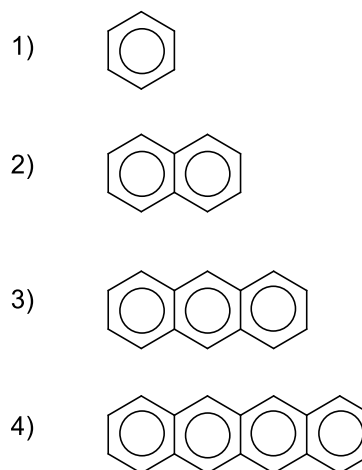
- (A) III and IV (B) I and IV
(C) II and IV (D) I and III

5. The Z, Z, Z, Z, Z – isomer of [10] annulene



(2014)

6. The HOMO-LUMO gap in the following four compounds from 1 to 4.



- (A) Increases
(B) Increase and then decrease
(C) Decrease and then increase
(D) Decreases

(2014)

7. Assertion (A): The bond angle in NF_3 is less than that in NH_3 .

Reason (R): The high electronegativity of F pulls the bonding electrons in NF_3 further away from N and a greater distortion is caused.

- (A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is not the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

NAME REACTION & REARRANGEMENT

PREVIOUS YEAR EXAM QUESTIONS

ANDHRA PRADESH SET

(2019)

1. Match the following.

Column-I

- P. Corey-House Synthesis
Q. Clemmenson's Reduction
R. Wurtz Reaction
S. Wolf-Kishner Reduction

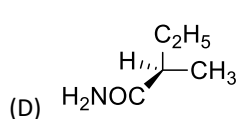
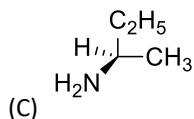
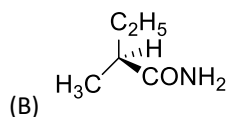
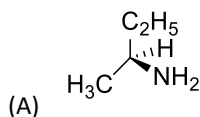
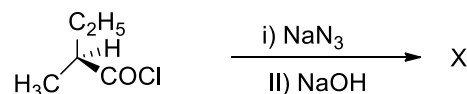
Column-II

1. $\text{NH}_2 \cdot \text{NH}_2 / \text{KOH}$
2. Na/Dry ether
3. Zn-Hg/Conc. HCl
4. R_2CuLi

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

(2019)

- 2.

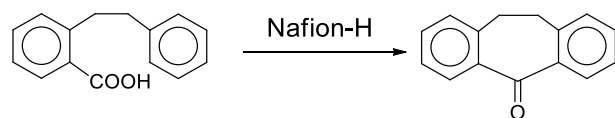


(2014)

3. Conversion of arylamines to fluoroarenes using
- HBF_4
- ,
- HNO_2
- is known as

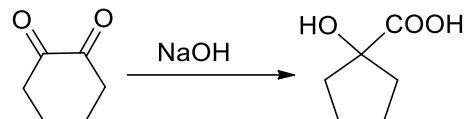
- (A) Scholl reaction (B) Schiemann reaction
(C) Simmons-Smith reaction (D) Weiss reaction

4. Identify the name reaction



- (A) Olah reaction (B) Price reaction
(C) Kulka reaction (D) Friedel-Crafts reaction

5. What is the other name for Benzil-Benzilic acid type rearrangement?



- (A) Leibig (B) Warren
(C) Houbert (D) Eastham

6. Match the following:

- I. Beckmann rearrangement 1. Oxetane
II. Paterno-Büchi reaction 2. Olefin
III. Wittig reaction 3. Enamine
IV. Stork reaction 4. Caprolactam

	I	II	III	IV
(A)	1	2	3	4
(B)	2	3	4	1
(C)	4	1	2	3
(D)	3	2	1	4

7. Which of the following reactions is an atom economy reaction?

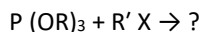
- (A) Claisen condensation (B) Friedel Crafts reaction
(C) Diels Alder reaction (D) Perkin reaction

(2013)

8. Hell-Volhard-Zelinsky reaction is conducted in presence of

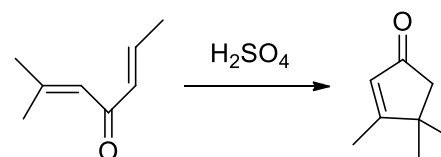
- (A) Iron (B) Zinc
(C) Magnesium (D) Phosphorous

9. Predict the products in the following Arbusov reaction



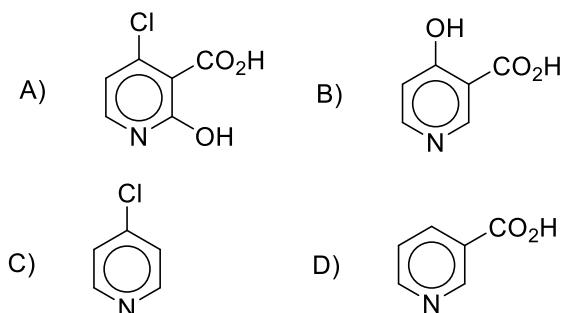
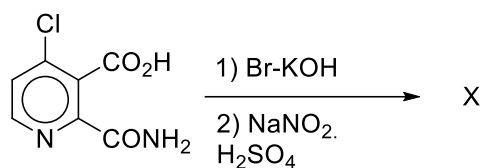
- (A) $[\text{R}'\text{PO}(\text{OR})_2]$ and $\text{R}'\text{X}$
(B) ROR' and $\text{P}(\text{OR})_2\text{X}$
(C) $[\text{R}'\text{R}\text{PO}_2(\text{OR})]$
(D) $\text{R}'\text{PO}(\text{OR})_2$ and RX

10. The following reaction is an example of

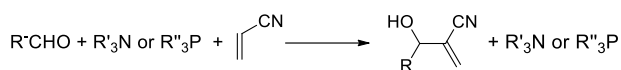


- (A) Neber-Bosset (B) Negishi
(C) Nenitzescu (D) Nazarov

11. What is 'X' in the following reaction?



12. Name the reaction:



- (A) Baylis-Hillman Reaction
 (B) Baylis Reaction
 (C) Morita-Baylis-Hillman Reaction
 (D) Hillman Reaction

CHHATTISGARH SET

(2017: 2 Mark)

1. In the Cannizzaro reaction, consider the following statements (I), (II) and (III) :

- (I) 2 Molecules of HCHO reacts with NaOH to form CH_3OH and HCOONa .
 (II) The transfer of hydride ion to the carbonyl group.
 (III) The attack of OH^- is at the carbonyl group.

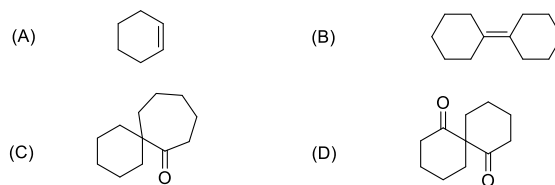
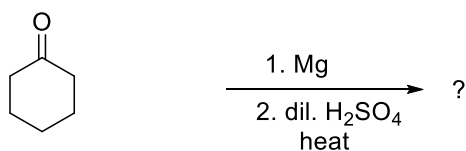
The correct from the following is:

- (A) (I) and (II) are correct and (II) is an explanation of (I)
 (B) (I) and (II) are correct and (II) is not an explanation of (I)
 (C) (I) is correct and (II) is incorrect
 (D) (II) and (III) are incorrect

GUJARAT SET

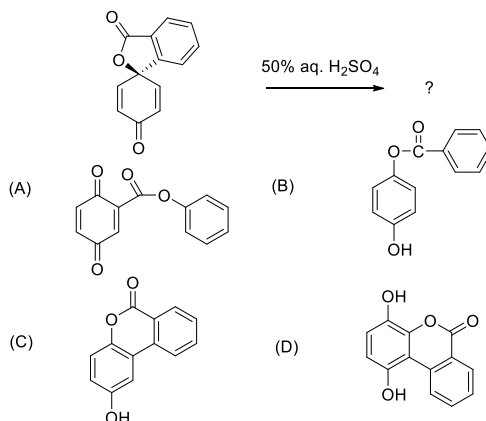
(2014)

1. Identify the major product in the following reaction: (Reaction)



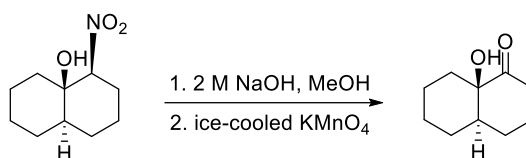
(2016)

2. Identify the product in the following reaction: (Reaction)



(2016)

3. Identify the name reaction involved in the following chemical conversion:



- (A) Nef reaction
 (B) Suzuki coupling
 (C) Mitsunobu reaction
 (D) Chugaev reaction

(2017)

4. Inversion of configuration of chiral alcohol can be efficiently carried out by employing one of the following reactions. Identify which: (Reaction)

- (A) Wittig reaction
 (B) Sharpless epoxidation
 (C) Mitsunobu reaction
 (D) Chugaev reaction

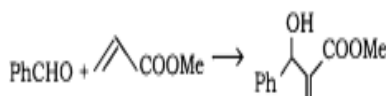
(2017)

5. Which of the following statements is incorrect for Wittig reaction?

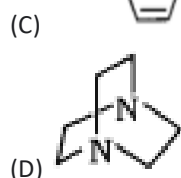
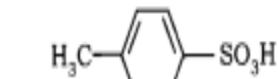
- (A) It involves reaction of an alkylidene phosphorene with carbonyl compound
 (B) Overall results is the formation of an olefin regiospecifically
 (C) Double-bond formation is non-regiospecific
 (D) Oxaphosphetane is an intermediate species in the reaction

(2022)

6. Suggest most suitable reagent for the following reaction.

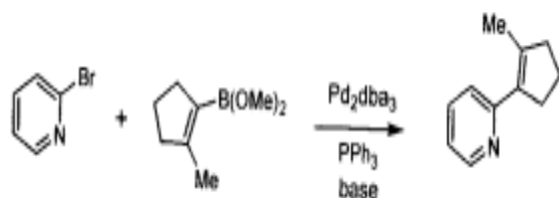


(A) NaOH/MeOH



(2022)

7. The following reaction is an example of Suzuki-Miyaura coupling. In the above C-C bond reaction, what is the active catalyst?

(A) Pd_2dba_3 (B) PPh_3 (C) $\text{Pd}(\text{PPh}_3)_4$ (D) $\text{Pd}(\text{II})$ salt

(2023: Set 2)

8. Synthon for synthesis of benzoin is

(A) Acetone

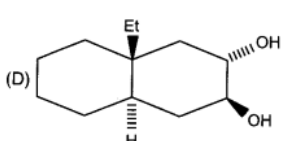
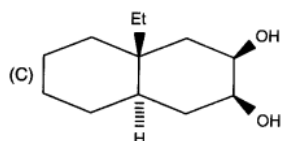
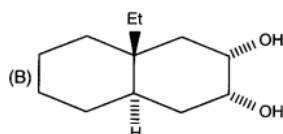
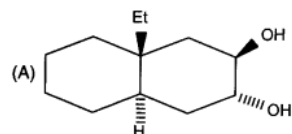
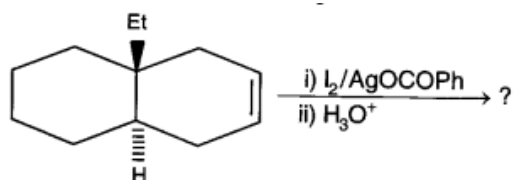
(B) Acetaldehyde

(C) Benzophenone

(D) Benzaldehyde

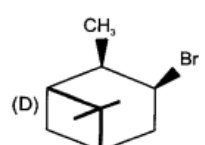
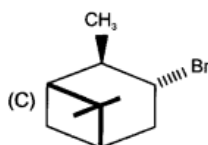
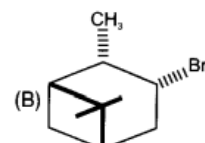
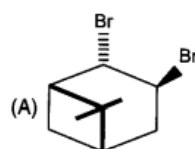
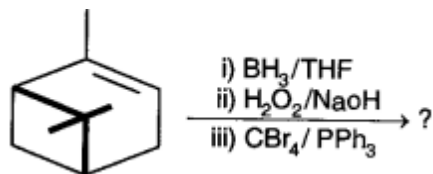
(2023: Set 2)

9. Major product for the following reaction is



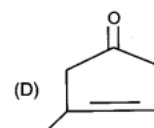
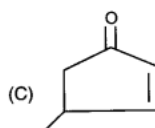
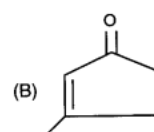
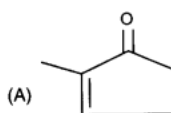
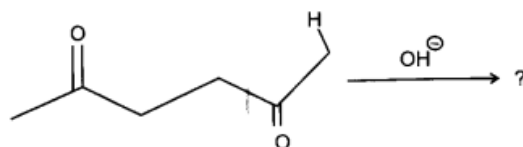
(2023: Set 2)

10. Predict the final product for the following reaction:



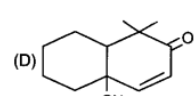
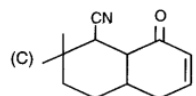
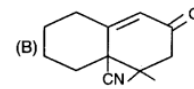
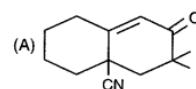
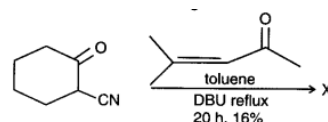
(2023: Set 2)

11. Predict the final product for the following reaction:



(2023: Set 2)

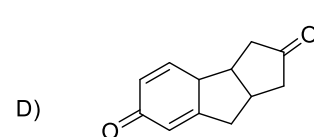
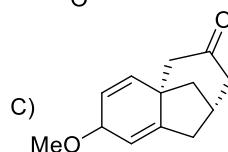
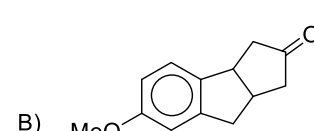
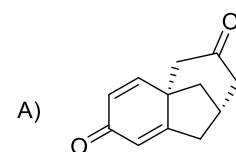
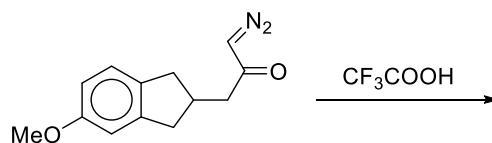
12. Predict X in the following transformation:



HIMACHAL PRADESH SET

(2014)

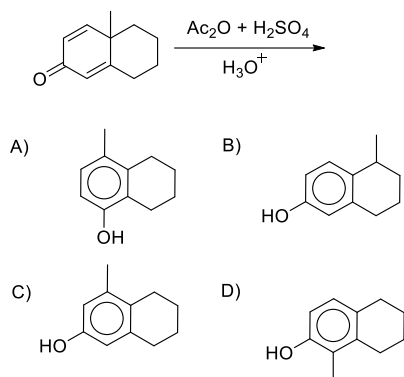
1. Major product in the following reaction is:-



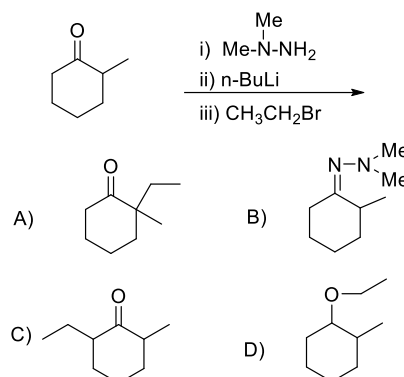
(2017)

KARNATAKA SET

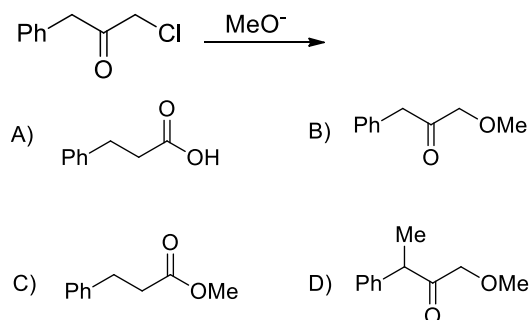
2. Major product in the following reaction is:-



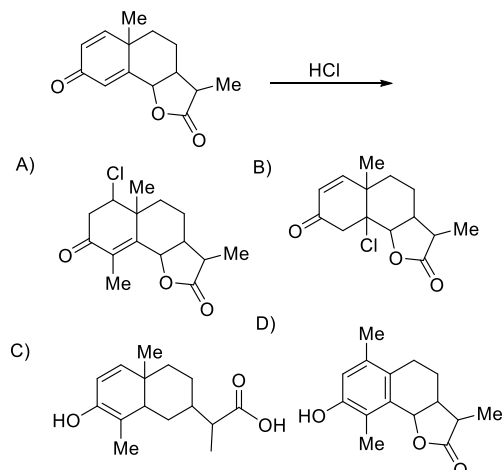
3. Major product in the following reaction is:-



4. Major product in the following reaction is:-



5. Major product in the following reaction is:-



- Identify the most stable reaction that makes simultaneously carbon-carbon and carbon-oxygen bonds.
 - Darzen's reaction
 - Diel's Alder reaction
 - Baeyer Villiger reaction
 - Aldol condensation

- Match List-I (Reaction) with List-II (Reactive intermediates involved) and select the correct answer from the options given below:-

List – I

List – II

- Dieckmann condensation
- Friedal-Crafts alkylation
- Hofmann rearrangement
- Riemer-Tiemann reaction

- Nitrene
- Carbene
- Carbocation
- Carbanion

- i – d, ii – c, iii – b, iv – a
- i – d, ii – c, iii – a, iv – b
- i – c, ii – d, iii – b, iv – a
- i – c, ii – d, iii – a, iv – b

- The effective transformation of acetophenone into ethylbenzene can be achieved by using:-
 - Clemmensen reduction
 - Wolff-Kishner reduction
 - Rosenmund reduction
 - Mozingo reduction
 - i, ii and iv are correct
 - i, ii and iii are correct
 - i and ii are correct
 - i, ii, iii and iv are correct

(2013)

- Ketones and aldehydes reacts with α – bromoesters and zinc metal powder to give:-
 - β -Hydroxy ethers
 - β -Hydroxy esters
 - α -Hydroxy esters
 - β -Hydroxy acids

(2013)

- Match the following:

List - 1

List - 2

- Wagner-Meerwein rearrangement
- Favorski rearrangement
- Hunsdiecker reaction
- Simmon-Smith reaction

- Carbenes
- Free radicals
- Carbocations
- Carbanion

Codes :

- a -iii, b-iv, c-ii, d-i
- a-ii, b-iii, c-iv, d-i
- a -i, b-iii, c-iv, d-ii
- a -iv, b-i, c-ii, d-iii

(2014)

6. Which of the following reactions involve carbon free radicals intermediate?

(A) Hunsdiecker reaction
(B) Acyloin condensation
(C) Sandmeyer reaction
(D) All the above reactions

(2015)

7. The rearrangement of acylcarbene to ketene is called:-

(A) Hofmann rearrangement
(B) Schmidt rearrangement
(C) Curtius rearrangement
(D) Wolff rearrangement

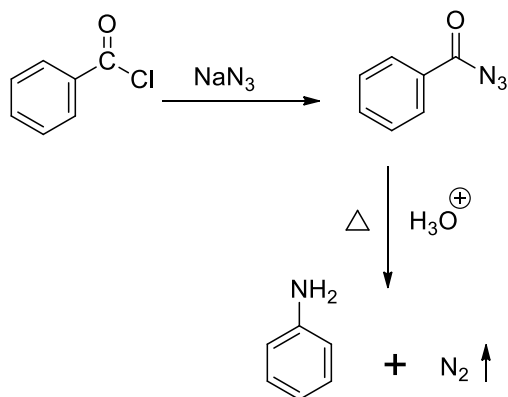
(2016)

8. The conversion of acetophenone to phenyl acetate is best accomplished by:-

(A) Curtius rearrangement
(B) Hofmann rearrangement
(C) Bayer - Villiger rearrangement
(D) Fries rearrangement

(2016)

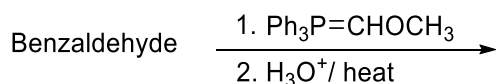
9. Name the reaction and the intermediate for the following reaction.



(A) Curtius rearrangement and nitrene
(B) Hofmann rearrangement and nitrene
(C) Lossen rearrangement and nitrene
(D) Reimer - Tieman rearrangement and carbene

(2018)

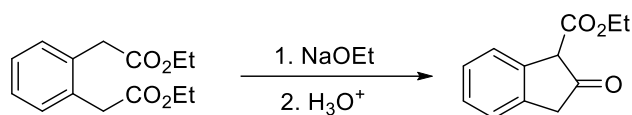
10. The major product in the following reaction is Benzaldehyde



(A) $\text{PhCH}=\text{CHCH}_3$
(B) PhCH_2CHO
(C) $\text{PhCH}_2\text{CH}_2\text{OH}$
(D) $\text{Ph}-\text{CH}=\text{CH}-\text{OCH}_3$

(2018)

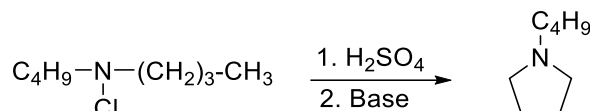
11. The reaction given below is an example of



(A) Aldol condensation
(B) Knoevenagel condensation
(C) Dieckmann cyclisation
(D) Acyloin cyclisation

(2020)

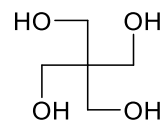
12. The following reaction is known as



(A) Shapiro reaction
(B) Barton reaction
(C) Baeyer-villiger reaction
(D) Hofmann-Loeffler-Freytag reaction

(2020)

13. Reaction of acetaldehyde with excess of formaldehyde in presence of NaOH yields



The name of this reaction is

(A) Cross cannizarro followed by aldol condensation
(B) Consecutive aldol condensation followed by cross cannizarro reaction
(C) Aldol condensation
(D) Cannizaro reaction

MADHYA PRADESH SET

(2018)

1. Reaction of bromoacetone with thiourea gives

(A) 2-Amino-4-methylthiazole
(B) 2-Mercapto-4-methylimidazole
(C) 2-Amino-4-methylthiazole and 2-Mercapto-4-methylimidazole
(D) No product

(2018)

2. The amination of pyridine with NaNH_2 in liquid NH_3 is called

(A) Suzuki reaction
(B) Chichibabin reaction
(C) Heck reaction
(D) Hoffman reaction

(2018)

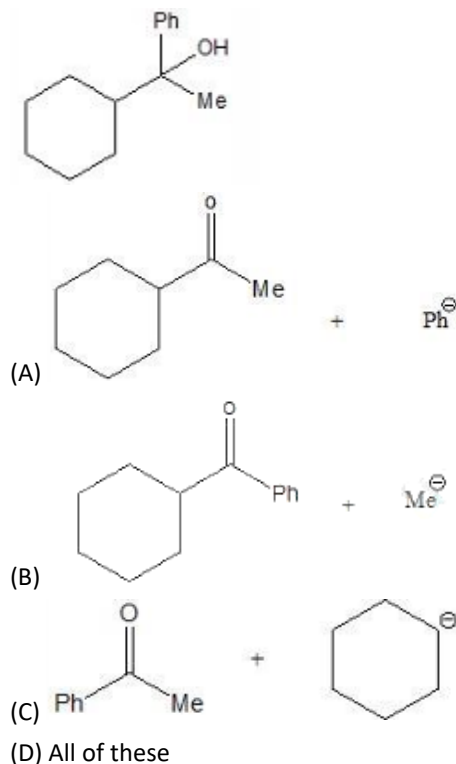
3. Correct statement is
- (A) Carboxylic acids do undergo substitution reaction under basic conditions.
- (B) Acid-catalyst increase the reactivity of carbonyl group in ketones.
- (C) Base-catalysed hydrolysis of ester is irreversible.
- (D) All of these

(2018)

4. Which of the following hydrazine is more reactive towards aldehyde?
- (A) 4-Methoxyphenyl hydrazine
- (B) 4-Nitrophenyl hydrazine
- (C) 2,4-Dinitrophenyl hydrazine
- (D) Phenyl hydrazine

(2018)

5. Which disconnection approach is better for the synthesis of



MAHARASHTRA SET

(2011)

- 1.
- $$\text{HCHO} + \text{CH}_3\text{CHO} \xrightarrow[300^\circ\text{C}]{\text{Sodium silicate}} \text{H}_2\text{C}=\text{CH}-\text{CHO}$$
- (A) Above reaction is an Aldol reaction in which acetaldehyde is an electrophile.
- (B) Above reaction is a Perkin reaction where formaldehyde is a nucleophile.

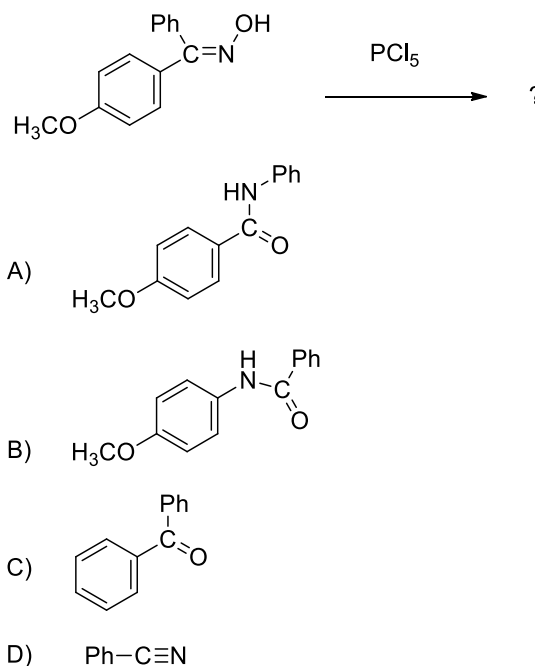
- (C) Above reaction is an Aldol reaction in which formaldehyde is an electrophile.
- (D) Above reaction is a Perkin reaction where acetaldehyde is a nucleophile.

(2011)

2. The above reaction is an example of:
- $(\text{CH}_3)_2\text{CHCH}_2\text{CON}_3$
 $(\text{CH}_3)_2\text{CHCH}_2\text{NH}_2$
- (A) Fries rearrangement (B) Lossen rearrangement
 (C) Schmidt rearrangement (D) Curtius rearrangement
3. $\text{H}_5\text{C}_2\text{OOC}-(\text{CH}_2)_4-\text{COOC}_2\text{H}_5$ on reaction with sodium in toluene followed by acidification gave a cyclic five membered beta-keto ester. The reaction is:
- (A) Aldol reaction
 (B) Dieckmann condensation
 (C) Claisen condensation
 (D) Perkin reaction

(2013)

4. The product in the following reaction is:



(2013)

5. The Stobbe condensation is treatment of ketone or aldehyde in presence of base with:
- (A) Anhydride (B) Diester
 (C) Aldehyde (D) Ketone

(2013)

6. The following reaction is an example of:
-

- (A) Mannich reaction
 (B) Vilsmeier-Haack formylation
 (C) Fridel-Craft reaction
 (D) Reimer-Tiemann reaction

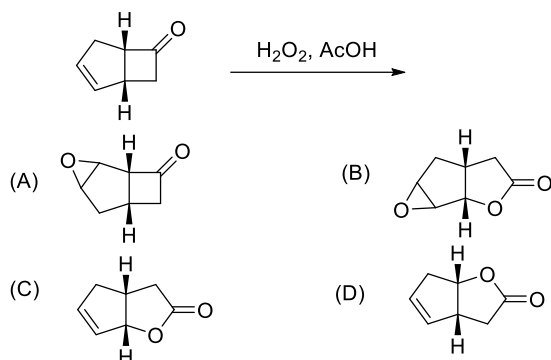
(2013)

7. In a Shapiro reaction, using 2-octanone, [p-toluenesulfonylhydrazone of 2-octanone treated with CH_3Li], the product obtained is:

- (A) 1-octene (B) (E)-2-octene
 (C) (Z)-2-octene (D) (Z)-3-octene

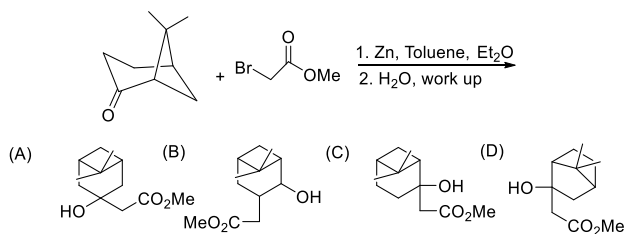
(2019)

8. The major product of the following reaction is:



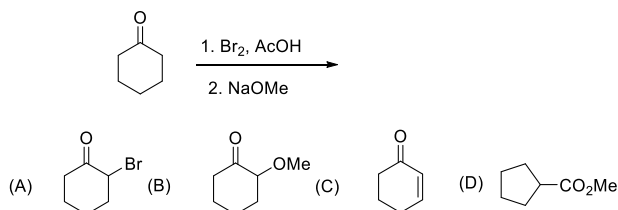
(2019)

9. The major product of the following reaction is:



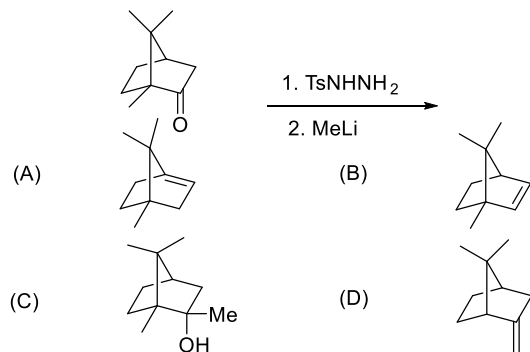
(2019)

10. The major product of the following reaction is:

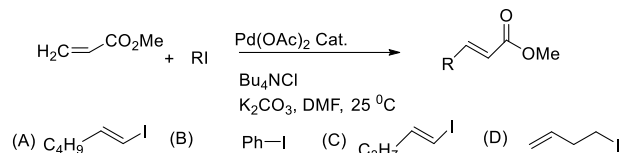


(2019)

11. The major product of the following reaction is:

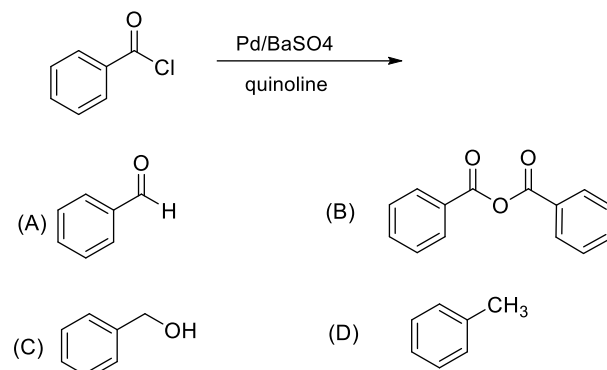


(2019)
 12. Which among the following substrates (R-I) is not suitable for the desired reaction below:



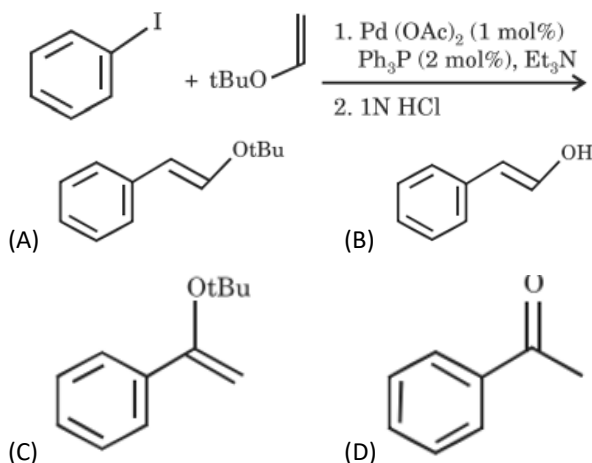
(2021)

13. The major product in the following reaction is:



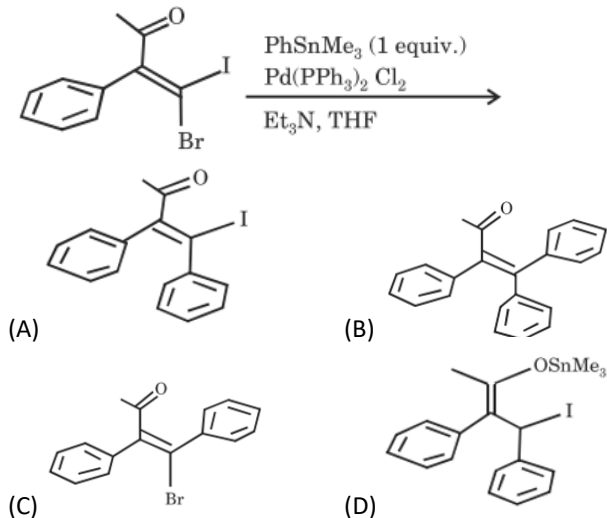
(2024)

14. Predict the major product of the following reaction:



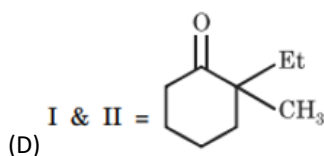
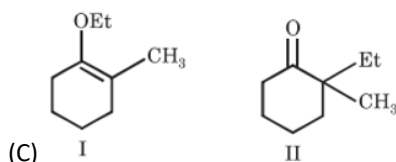
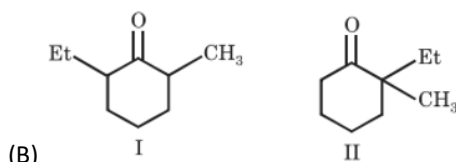
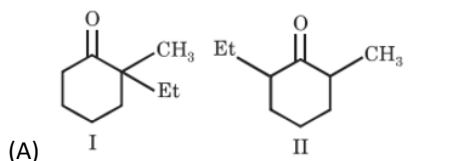
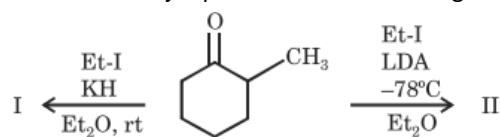
(2024)

15. Predict the major product of the following reaction:



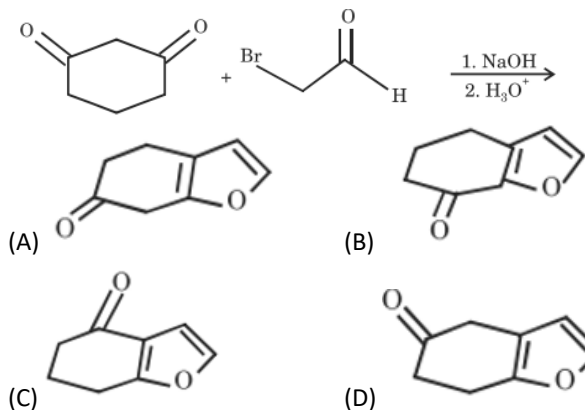
(2024)

16. Predict the major product of the following reactions:



(2024)

17. Predict the major product of the following reaction:



TELANGANA SET

1. Match the following:

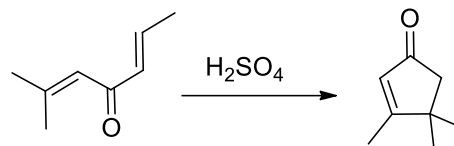
- | | |
|----------------------------|----------------|
| I. Beckmann rearrangement | 1. Oxetane |
| II. Paterno-Büchi reaction | 2. Olefin |
| III. Wittig reaction | 3. Enamine |
| IV. Stork reaction | 4. Caprolactam |

- | | | | |
|-------|----|-----|----|
| I | II | III | IV |
| (A) 1 | 2 | 3 | 4 |
| (B) 2 | 3 | 4 | 1 |
| (C) 4 | 1 | 2 | 3 |
| (D) 3 | 2 | 1 | 4 |

2. Which of the following reactions is an atom economy reaction?

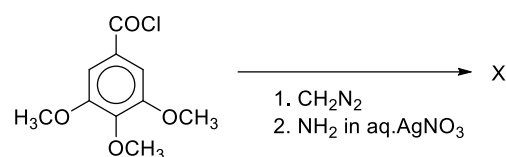
- (A) Claisen condensation (B) Friedel Crafts reaction
(C) Diels Alder reaction (D) Perkin reaction

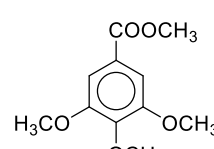
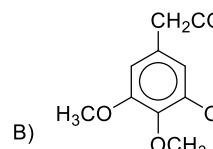
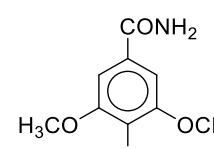
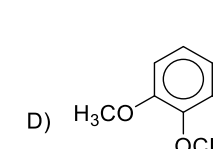
3. The following reaction is an example of



- (A) Neber-Bosset (B) Negishi
(C) Nenitzescu (D) Nazarov

4. What is "X" in the following reaction?

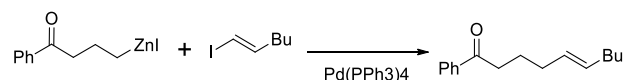


- A)  B) 
- C)  D) 

5. Substituted isoquinoline compounds can be prepared by

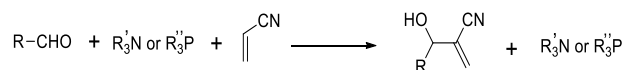
- (A) Skraup synthesis
(B) Bischler-Napieralski synthesis
(C) Haworth synthesis
(D) Bogert-Cook synthesis

6. The reaction given below is an example of



- (A) Nazarov reaction (B) Nef reaction
(C) Negishi reaction (D) Nicholas reaction

7. Name the reaction:



- (A) Baylis-Hillman Reaction
(B) Baylis Reaction
(C) Morita-Baylis-Hillman Reaction
(D) Hillman Reaction

8. Match the following:

- I. Furfyl acrylic acid from furfural
 II. 8-quinolinol from O-amino phenol
 III. Indole-3-carboxaldehyde
 IV. 1-Methyl Iso-quinoline from β -phenyl ethyl

1. Skraup synthesis
 2. Perkin reaction
 3. BischlerNapieralski reaction
 4. Reimer-Tiemann reaction amine
 5. Grignard reaction

	I	II	III	IV
(A)	1	3	5	2
(B)	4	2	1	5
(C)	2	1	4	3
(D)	2	3	1	4

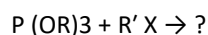
(2013)

9. Hell-Volhard-Zelinsky reaction is conducted in presence of

- (A) Iron (B) Zinc
 (C) Magnesium (D) Phosphorous

(2013)

10. Predict the products in the following Arbuzov reaction



- (A) $[R'PO(OR)_2]$ and $R'X$ (B) ROR' and $P(OR)_2X$
 (C) $[R'RPO_2(OR)]$ (D) $R'PO(OR)_2$ and RX

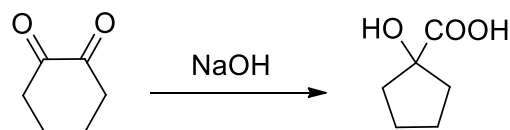
(2014)

11. Conversion of arylamines to fluoroarenes using $HBFe_4$, HNO_2 is known as

- (A) Scholl reaction
 (B) Schiemann reaction
 (C) Simmons-Smith reaction
 (D) Weiss reaction

(2014)

12. What is the other name for Benzil-Benzilic acid type rearrangement?



- (A) Leibig (B) Warren
 (C) Houbert (D) Eastham

(2017)

13. Dichloro carbene is an intermediate in which of the following?

- (A) Reimer-Tiemann reaction
 (B) Hofmann reaction
 (C) Reimer-Tiemann reaction and carbylamine reactions
 (D) Beckmann rearrangement

(2017)

14. The named organic reaction involving both C-C and C-O bonds formation is:

- (A) Darzen'sglycidic ester reaction
 (B) Lossen Rearrangement
 (C) PausonKohand reaction
 (D) Henry reaction

(2018)

15. Match the following

a. Beckmann Rearrangement	i. Oxetane
b. Paterno Buchi Reaction	ii. Olefin
c. Wittig reaction	iii. Enamine
d. Stork reaction	iv. Caprolactum

Codes:

- (A) a- iv; b-i; c-iii; d- ii (B) a- ii; b-iii; c-iv; d- i
 (C) a- iv; b-i; c-ii; d- iii (D) a- ii; b-iii; c-i; d- iv

(2018)

16. Hell-Volhard-Zelinsky reaction is conducted in the presence of

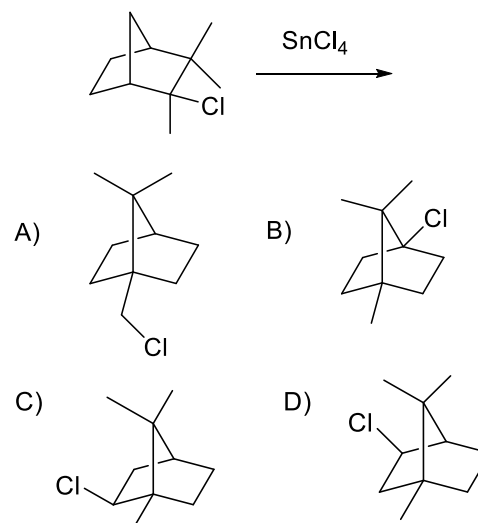
- (A) Magnesium (B) Phosphorus
 (C) Zinc (D) Iron

WEST BENGAL SET

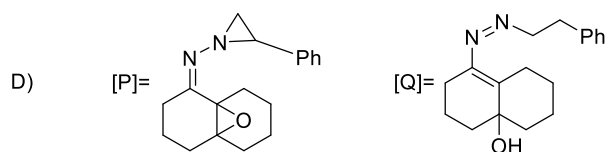
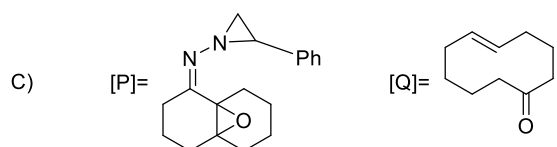
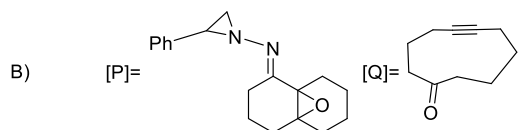
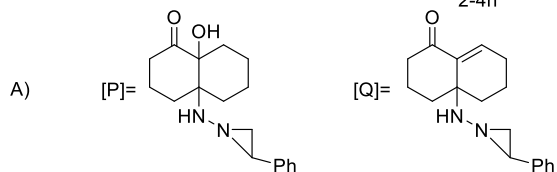
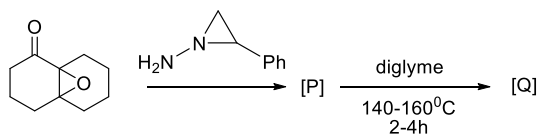
1. The molecular rearrangement that involves migration to an electron rich carbon is

- (A) Wittig rearrangement
 (B) Hofmann rearrangement
 (C) Wagner-Meerwein rearrangement
 (D) Baeyer-Villiger rearrangement

2. The major product of the following reaction is

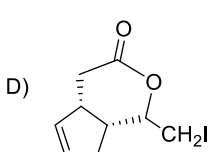
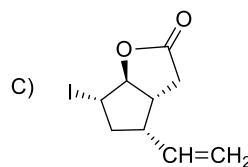
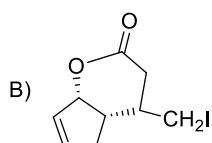
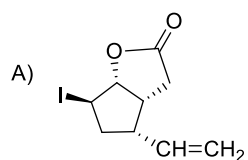
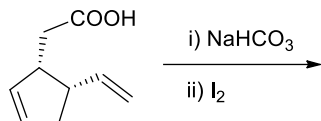


3. The major products [P] and [Q] formed in the following reaction sequence are:



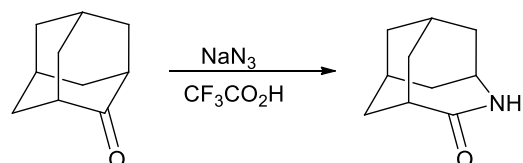
(2018)

4. The major product of the following reactions is:



(2020)

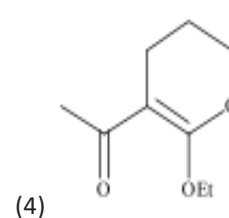
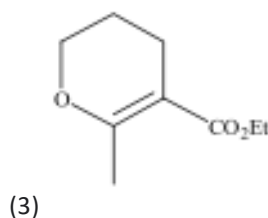
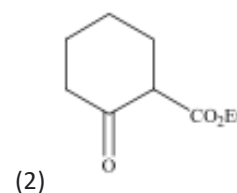
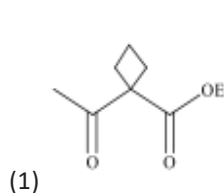
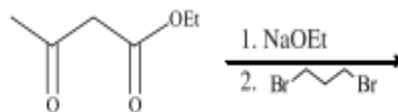
5. The following reaction is an example of



- (A) Beckmann rearrangement
(B) Schmidt reaction
(C) Hofmann rearrangement
(D) Curtius rearrangement

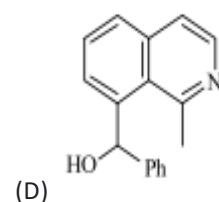
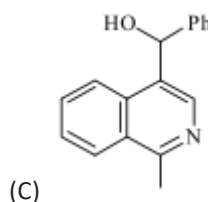
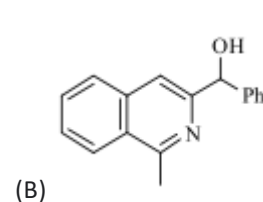
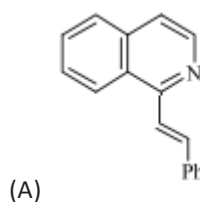
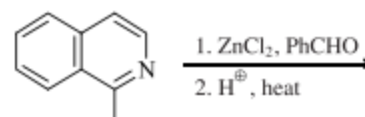
(Set 2021: 2Mark)

6. The outcome of the reaction sequence is:



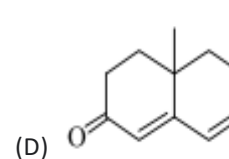
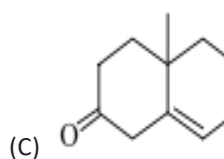
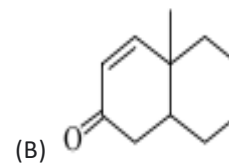
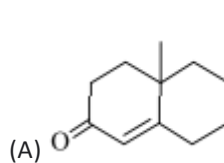
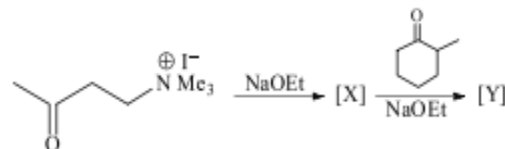
(Set 2021: 2Mark)

7. The product of the reaction is:



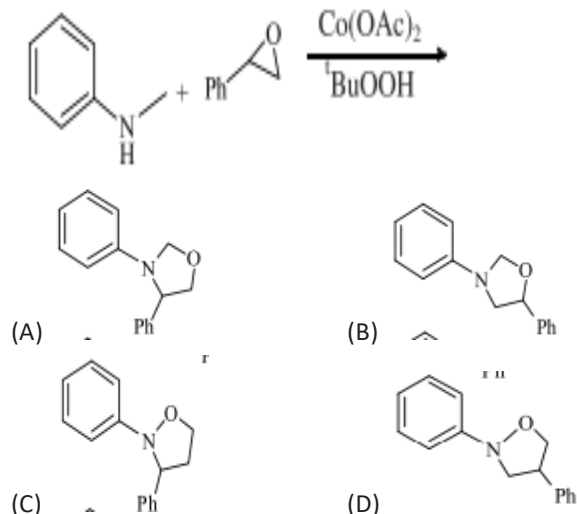
(Set 2021: 2Mark)

8. The product (Y) of the following reaction sequence is:



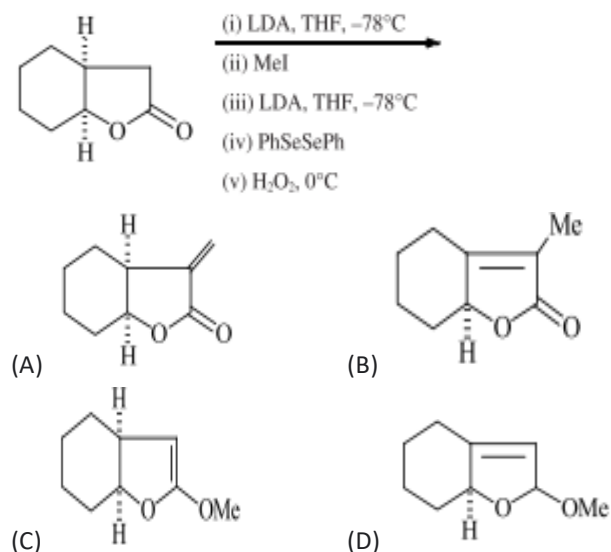
(Set 2021: 2Mark)

9. The major product of the reaction is:



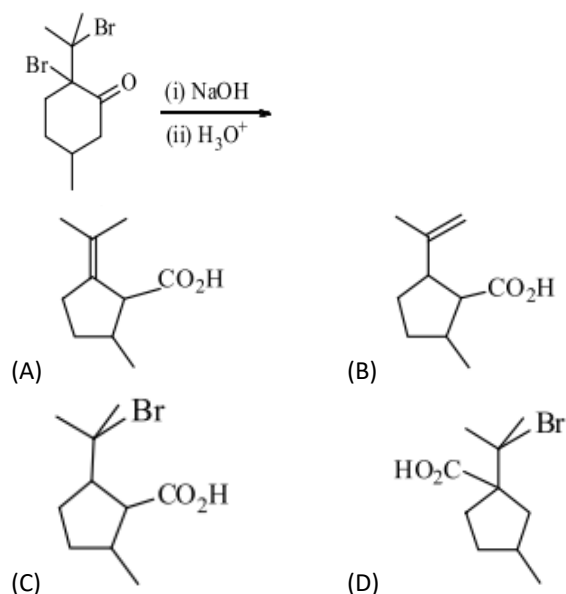
(Set 2021: 2Mark)

10. The major product of the following reaction is:



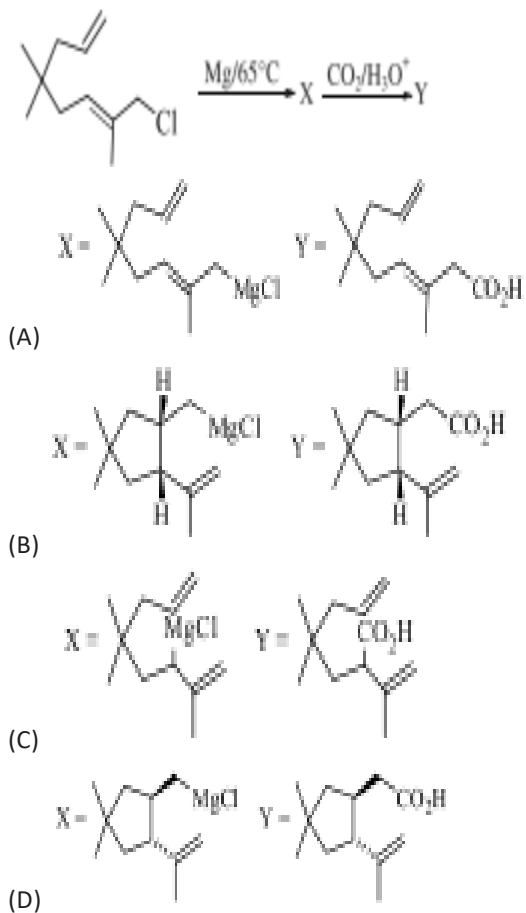
(Set 2021: 2Mark)

11. The major product of the following reaction is:



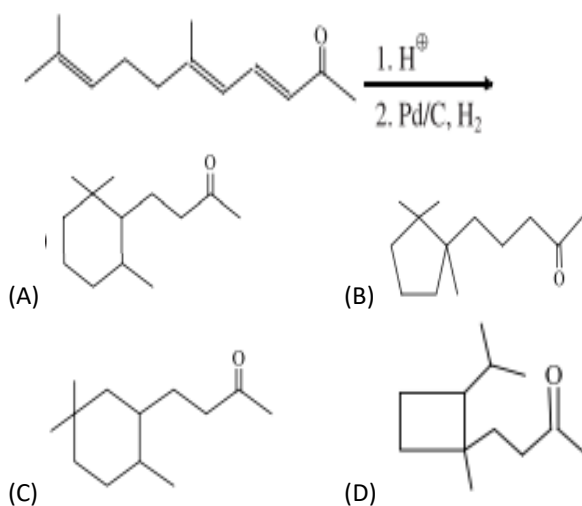
(Set 2021: 2Mark)

12. The major products X and Y in the following reaction sequence are:



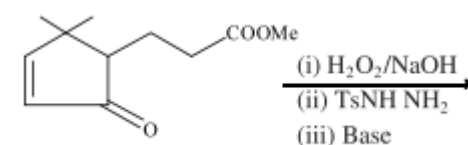
(Set 2021: 2Mark)

13. The major product of the reaction is:



(Set 2021: 2Mark)

14. The major outcome of the following reaction is:

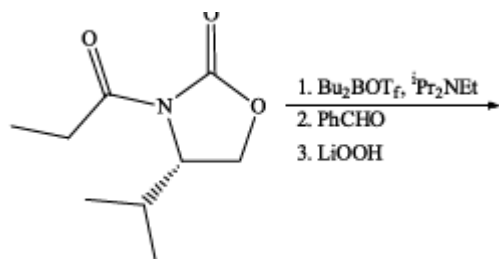


(2022: 2 Mark)

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

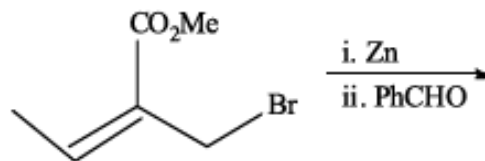
(2022: 2 Mark)

15. The following reaction sequences produce the major stereoisomer



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

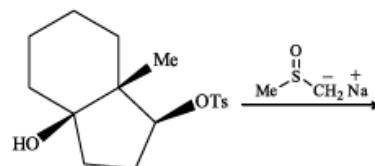
16. The correct structure of the product in the following sequence is



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

(2022: 2 Mark)

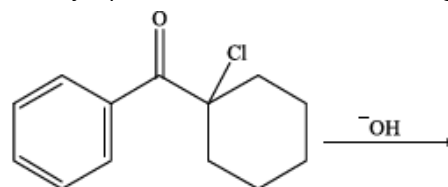
17. The major product format in the following reaction is

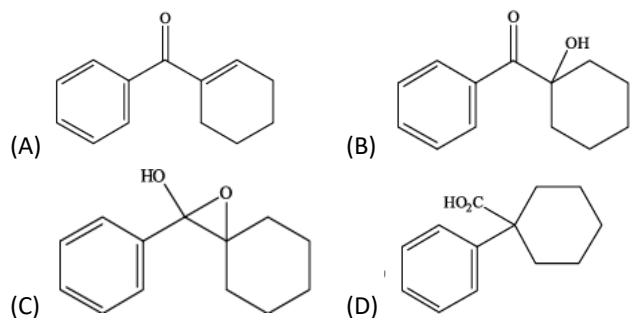


- (A)
- (B)
- (C)
- (D)

(2022: 2 Mark)

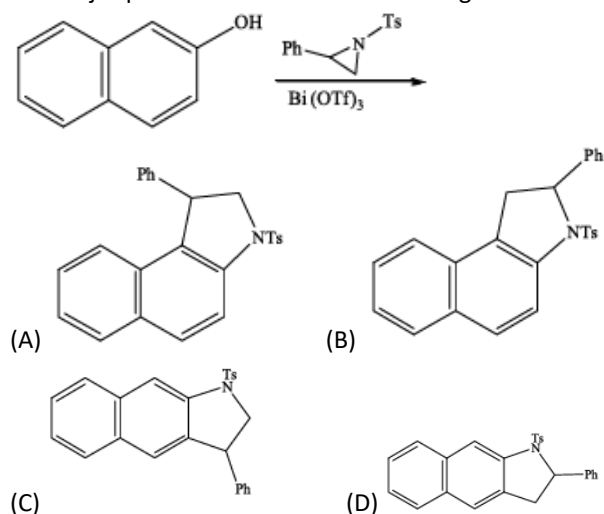
18. The major product formed in the following reaction is





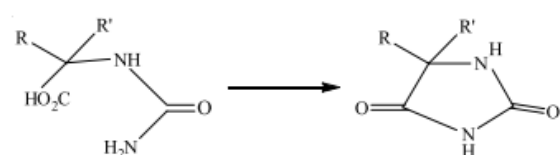
(2022: 2 Mark)

19. The major product formed in the following reaction is:



(2023: 2 Mark)

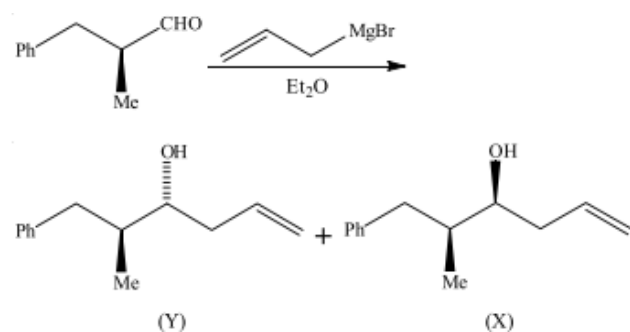
20. The rate of following amidification reaction follows the order:

Rate

- (1) $R = R' = H$ K_1
 (2) $R = \text{Me}, R' = H$ K_2
 (3) $R = R' = \text{Me}$ K_3
 (A) $k_1 > k_2 > k_3$ (B) $k_2 > k_3 > k_1$
 (C) $k_2 > k_1 > k_3$ (D) $k_3 > k_2 > k_1$

(2023: 2 Mark)

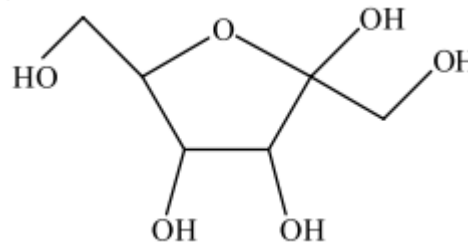
21. Which statement is true for the following transformation?



- (A) (X) is major and it is Cram product.
 (B) (X) is major and it is anti-Cram product.
 (C) (Y) is major and it is Cram product.
 (D) (Y) is major and it is anti-Cram product.

(2023: 2 Mark)

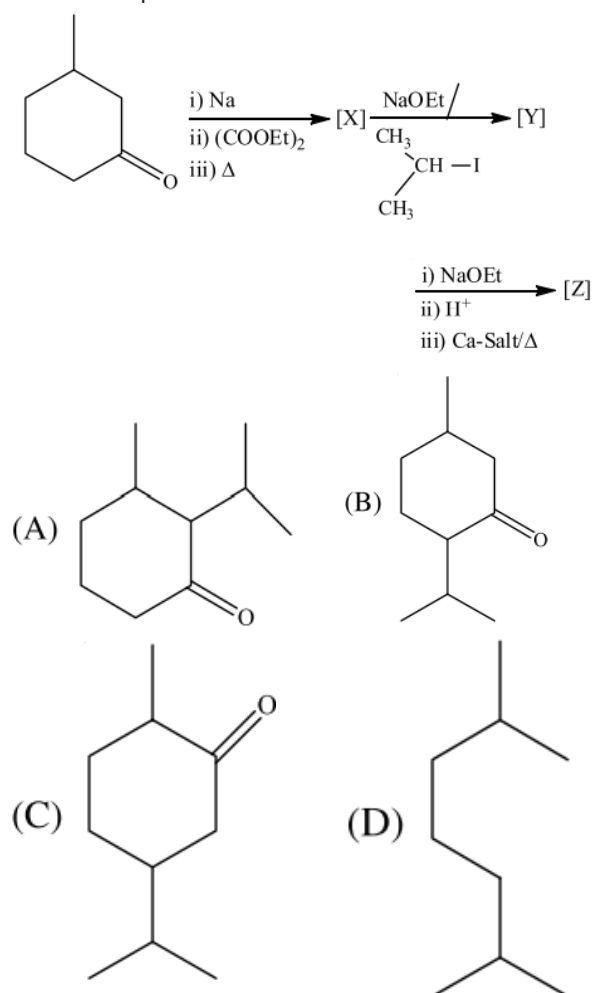
22. Choose the correct description of the following sugar from the given options.



- (A) α furanose and ketose
 (B) β -furanose and ketose
 (C) β -pyranose and aldose
 (D) α -pyranose and aldose

(2023: 2 Mark)

23. The correct structure of the product (Z) in the following reaction sequence is



ANSWER KEY

ANDHRA PRADESH

1	2	3	4	5	6	7	8	9	10
C	A	B	D	A	C	C	D	A	D

11 12

A A

CHHATTISGARH

1

B

GUJARAT

1	2	3	4	5	6	7	8	9	10
C	C	A	C	C	D	C	D	A	D

11 12

B B

HIMACHAL PRADESH

1	2	3	4	5
A	C	C	C	D

KARNATAKA

1	2	3	4	5	6	7	8	9	10
A	B	A	B	A	D	D	C	A	B

11 12 13

C D B

MADHYA PRADESH

1	2	3	4	5
A	B	D	A	A

MAHARASHTRA

1	2	3	4	5	6	7	8	9	10
C	D	B	B	B	D	A	D	C	D

11 12 13 14 15 16 17

B D A D C A C

TELANGANA

1	2	3	4	5	6	7	8	9	10
C	C	D	B	B	C	A	C	D	A

11 12 13 14 15 16

B A A A C B

WEST BENGAL

1	2	3	4	5	6	7	8	9	10
A	C	B	A	B	A	A	A	A	B

11 12 13 14 15 16 17 18 19 20

A B A B D A C D A D

21 22 23

A B B

SOLUTIONS

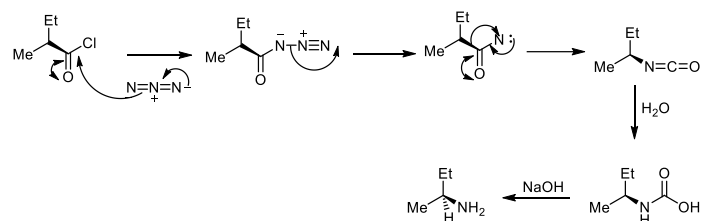
ANDHRA PRADESH SET

1. Solution: (C)

P. Corey-house synthesis – R_2CuLi Q. Clemmenson reduction – $\text{Zn-Hg/HCl}(\text{conc.})$ R. Wurtz reaction - Na/dry ether S. Wolf-kishner reduction – $\text{H}_2\text{N-NH}_2/\text{KOH}$

Hence, Correct option is (C).

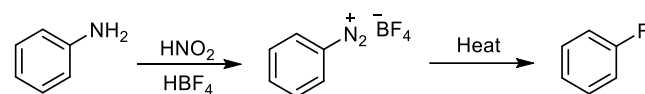
2. Solution: (A)



As 1, 2 migration is concerted process so, stereo must remain same.

Hence, Correct option is (A).

3. Solution: (B)

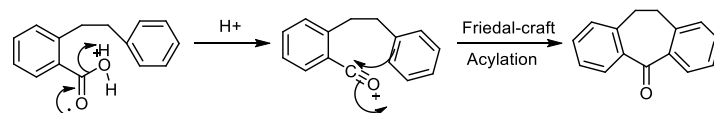


Diazonium salt is formed which upon heating gives fluore-arene. That reaction is called balz-schieman reaction

Hence, Correct option is (B).

4. Solution: (D)

Nafion-H is a sulfonated tetrafluoroethylene-based polymer.



Hence, Correct option is (D).

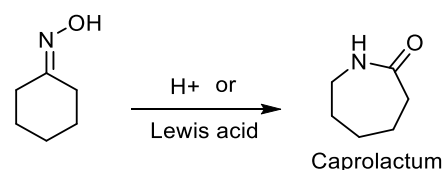
5. Solution: (A)

Rearrangement reaction of diketone is also known as Liebig rearrangement reaction.

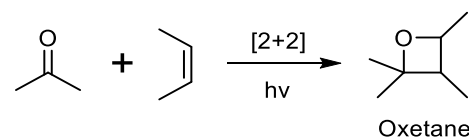
Hence, Correct option is (A).

6. Solution: (C)

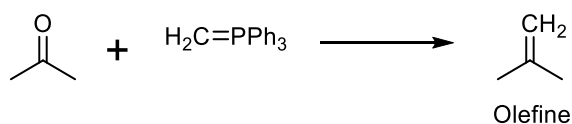
Beckmann rearrangement: -



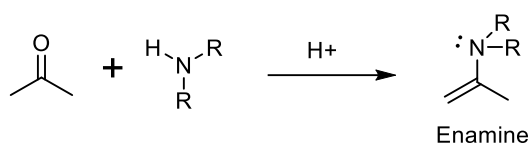
Paterno-buchi reaction: -



Wittig reaction: -



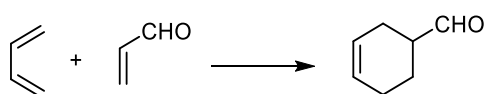
Stork reaction: -



Hence, Correct option is (C).

7. **Solution: (C)** Good atom economic means most of the atom of reactant are present in desired product and only small amount of side product formed in diels alder reaction atom economy is very high.

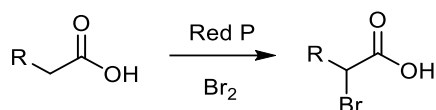
Exa.



100% atom economy, no side product obtained.

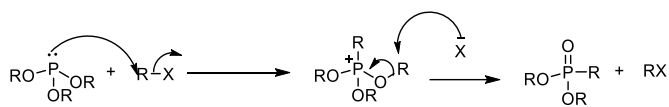
Hence, Correct option is (C).

8. **Solution: (D)**



Hence, Correct option is (D).

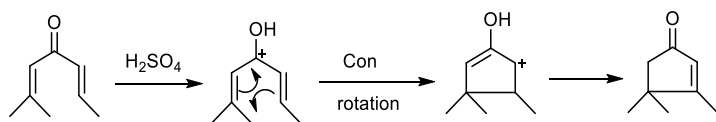
9. **Solution: (A)**



The reaction of trialkyl phosphite with an alkyl halide to form an alkyl phosphonate is called as Arbuzov reaction.

Hence, Correct option is (A).

10. **Solution: (D)**

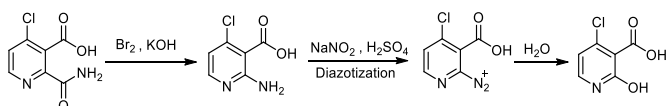


This reaction is Nazarov cyclization.

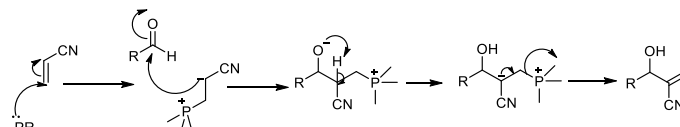
Hence, Correct option is (D).

11. **Solution: (A)** The reaction of Br_2 with KOH forms sodium hypobromite, which transforms the amide into an intermediate isocyanate. The intermediate isocyanate is hydrolyzed to amine, giving off CO_2 .

Hence, Correct option is (A).



12. **Solution: (A)** Baylis-Hillman reaction is C-C bond forming reaction between the alpha position of activated alkene and aldehyde or ketone.



Hence, Correct option is (A).

CHHATTISGARH SET

1. **Solution:**

Statement (I): "2 Molecules of HCHO reacts with NaOH to form CH_3OH and HCOONa ."

This statement is correct. In the Cannizzaro reaction, two molecules of formaldehyde (HCHO) react in the presence of a strong base (NaOH), resulting in one molecule being oxidized to formate ion (HCOO^-) and the other being reduced to methanol (CH_3OH).

Statement (II): "The transfer of hydride ion to the carbonyl group."

This statement is also correct. The Cannizzaro reaction involves the transfer of a hydride ion (H^-) from one formaldehyde molecule to another, facilitating the redox process where one molecule is reduced and the other is oxidized.

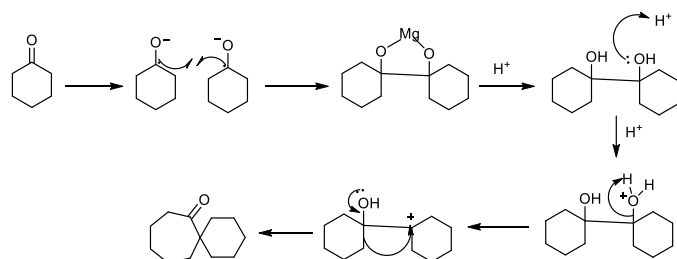
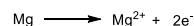
Statement (III): "The attack of OH^- is at the carbonyl group."

This statement is correct as well. The reaction mechanism involves an initial nucleophilic attack by the hydroxide ion (OH^-) on the carbonyl carbon of formaldehyde, leading to the formation of a tetrahedral intermediate.

Hence, Correct option is (B).

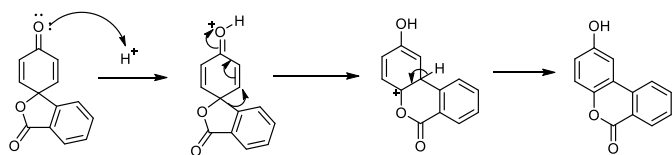
GUJARAT SET

1. **Solution: (C)**



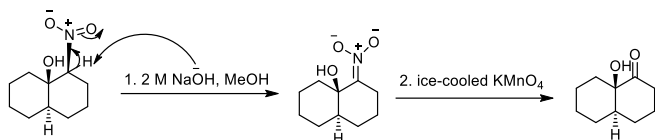
Hence, Correct option is (C).

2. Solution: (C)



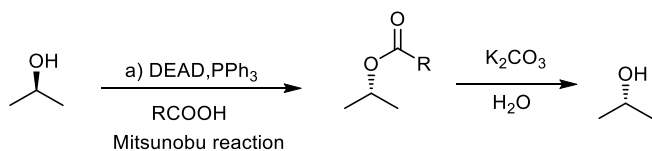
Hence, Correct option is (C).

3. Solution: (A)



Hence, Correct option is (A).

4. Solution: (C)

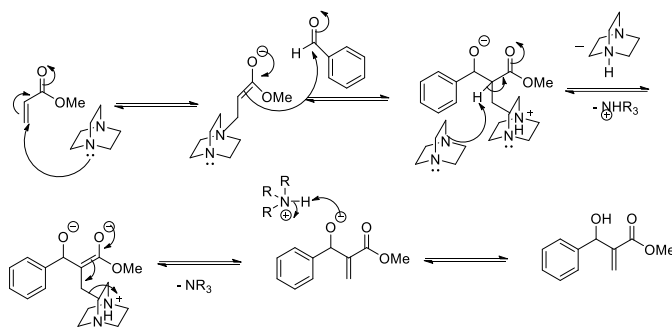


Hence, Correct option is (C).

5. **Solution: (C)** Wittig reaction occurs between alkylidene phosphorene with carbonyl compound and formation of stereospecific olefin(alkene) with oxaphosphetane as an intermediate.

Hence, Correct option is (C).

6. Solution: (D)



Hence, Correct option is (D).

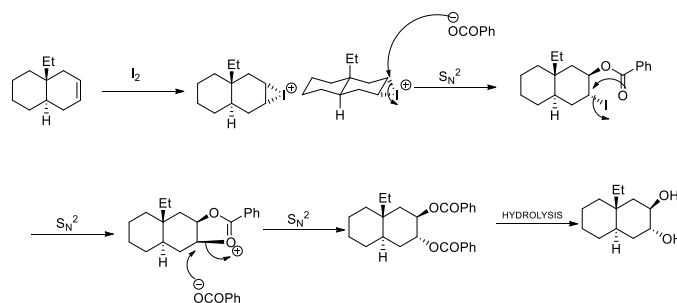
7. **Solution: (C)** The reaction depicted is a **Suzuki-Miyaura coupling**, which involves the coupling of an organoboron compound (in this case, a boronic ester) with an aryl halide, facilitated by a palladium catalyst.

Pd(PPh₃)₄ (tetrakis(triphenylphosphine)palladium(0)) is typically the active catalyst in Suzuki-Miyaura couplings. It is a palladium(0) complex, which is crucial for the oxidative addition step in the catalytic cycle.

Hence, Correct option is (C).

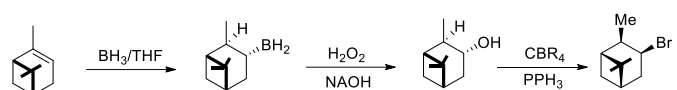
8. Solution: (D)

9. Solution: (A)



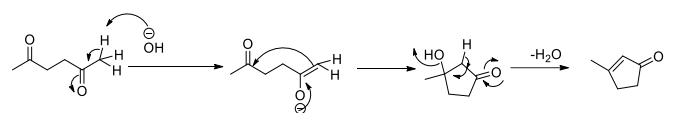
Hence, Correct option is (A).

10. Solution: (D)



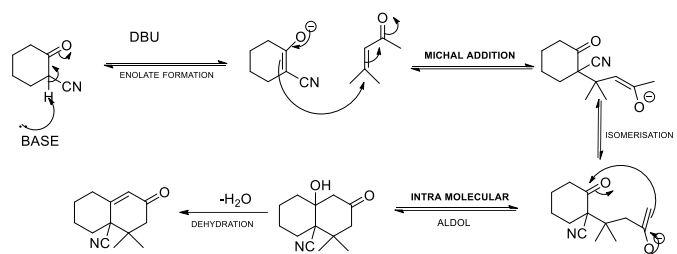
Hence, Correct option is (D).

11. Solution: (B)



Hence, Correct option is (B).

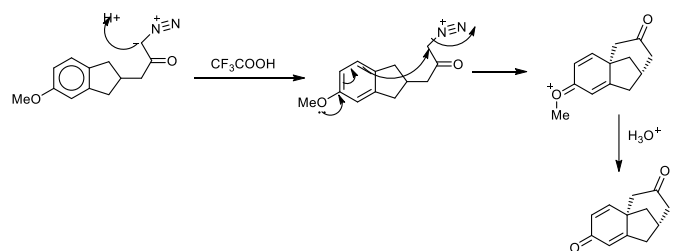
12. Solution: (B)



Hence, Correct option is (B).

HIMACHAL PRADESH SET

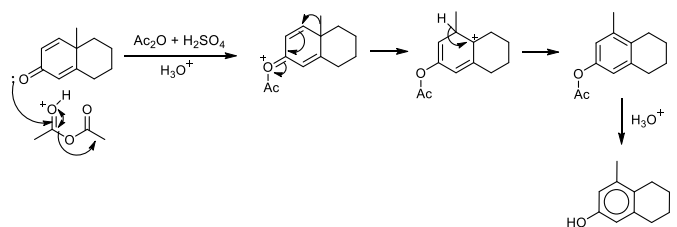
1. Solution: (A)



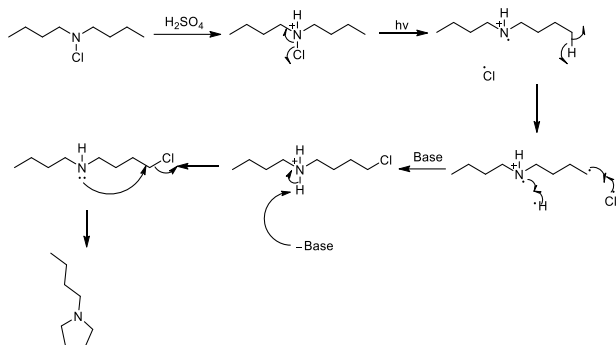
Hence, Correct option is (A).

2. Solution: (C)

It is Dienone Phenol rearrangement.

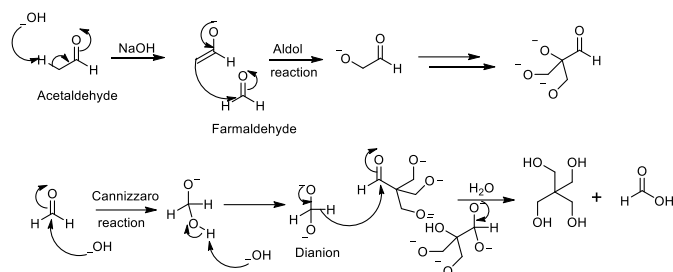


Hence, Correct option is (C).



Hence, Correct option is (D).

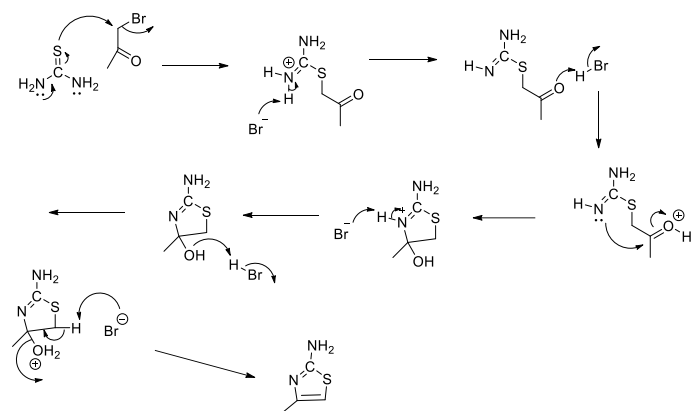
13. Solution: (B)



Hence, Correct option is (B).

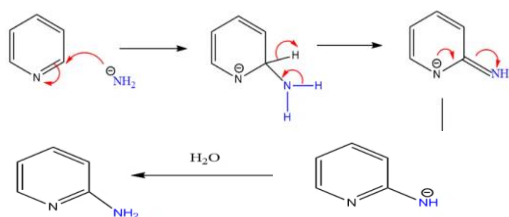
MADHYA PRADESH SET

1. Solution: (A)



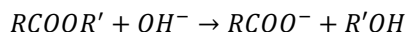
Hence, Correct option is (A).

2. Solution: (B)

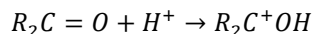


Hence, Correct option is (B).

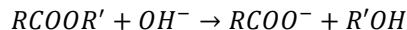
3. Solution: (D) Carboxylic acids undergo substitution under basic conditions, such as saponification:



Acid catalysts increase carbonyl reactivity by protonating the carbonyl oxygen:



Base-catalyzed hydrolysis of esters is irreversible due to stable carboxylate formation:

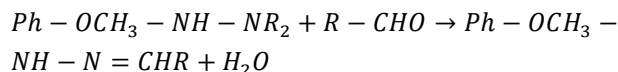


Since all statements are correct, the answer is (4) All of These.

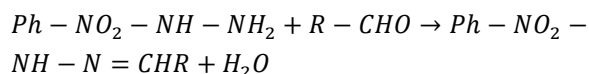
Hence, Correct option is (D).

4. Solution: (A)

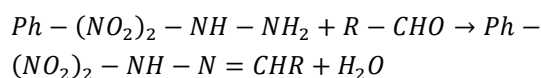
(A) 4-Methoxyphenyl Hydrazine



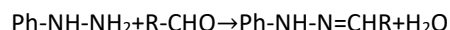
(B) 4-Nitrophenyl Hydrazine



(C) 2,4-Dinitrophenyl Hydrazine



(D) Phenyl Hydrazine



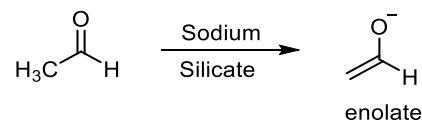
Hence, Correct option is (A).

5. Solution: (A)

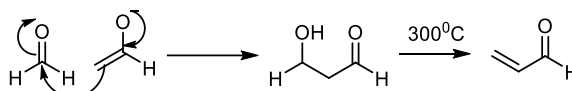
MAHARASHTRA SET

1. Solution: (C)

In first step enolate will be formed.



Now, enolate will attack on highly electrophilic formaldehyde molecule, this reaction is called as cross-Aldol reaction.



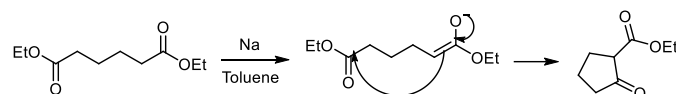
Hence, Correct option is (C).

2. Solution: (D)

Reaction of acyl azide to form amine (nitrene as a intermediate) is called Curtius rearrangement.

Hence, Correct option is (D).

3. Solution: (B)

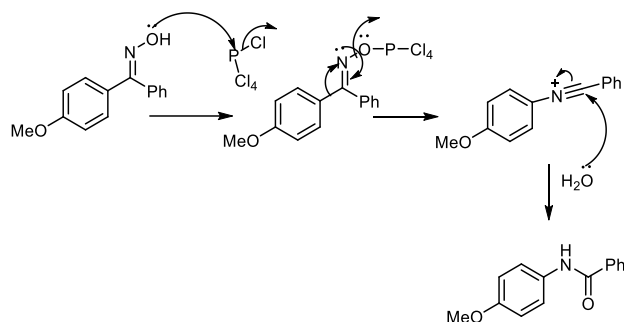


Diester compound can undergo intramolecular condensation which is known as Dieckmann condensation.

Hence, Correct option is (B).

4. Solution: (B)

The given reaction is Beckmann rearrangement.



In Beckmann reaction, anti-group with respect to OH migrate.

Hence, Correct option is (B).

5. Solution: (B)

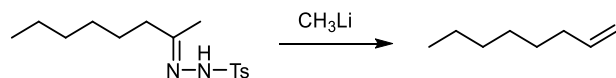
The reaction of aldehyde or ketone with Diester is known as Stobbe condensation.

Hence, Correct option is (B).

6. Solution: (D)

Formation of aldehyde in presence of base and CHCl_3 called Reimer-Tiemann reaction.

Hence, Correct option is (D).

7. Solution: (A)

p-toluenesulfonylhydrazide

1-octene

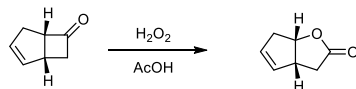
In Shapiro reaction H is removed from less substituted position.

Hence, Correct option is (A).

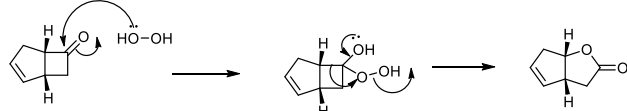
8. Solution: (D)

H_2O_2 in acidic medium undergoes Bayer-Villiger oxidation. It does not epoxidize alkene.

As migratory aptitude of secondary alkyl group is more than primary.



Mechanism :-

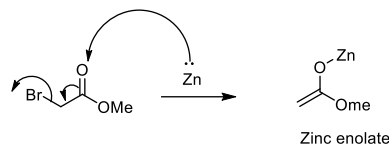


Hence, Correct option is (D).

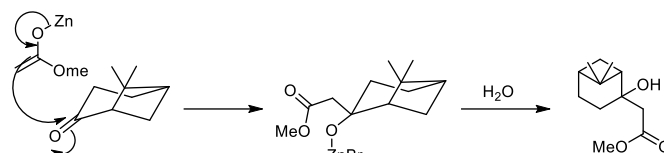
9. Solution: (C)

The given reaction is Reformatsky reaction.

1st step, formation of zinc enolate & in 2nd zinc enolate attack on ketone and formation of Beta-hydroxy ester.



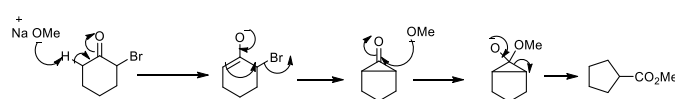
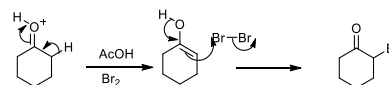
Zinc enolate



Hence, Correct option is (C).

10. Solution: (D) In first step Bromination at alpha position.

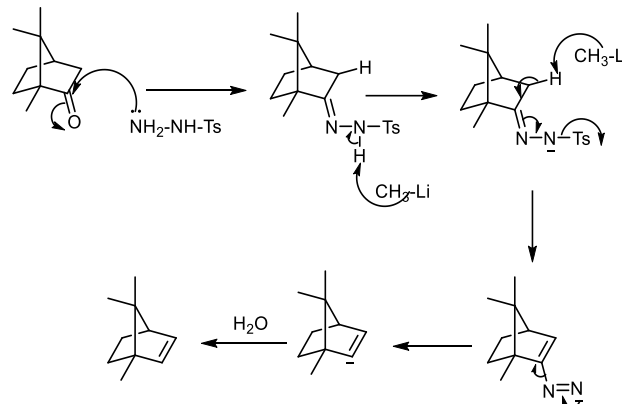
Second step is Favorskii rearrangement.



Hence, Correct option is (D).

11. Solution: (B)

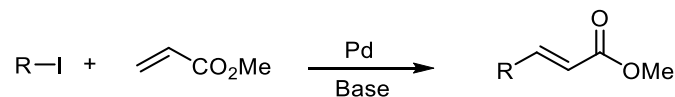
Ts-NH-NH₂ (Tosyl hydrazine) react with ketone to form tosyl hydrazone which undergoes Shapiro reaction in presence of strong base.



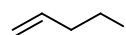
Hence, Correct option is (B).

12. Solution: (D)

The given reaction is Heck Coupling reaction.



The R group in R-I can be aryl group, vinyl group or alkyl group having no beta hydrogen on SP^3 carbon Atom.



The given compound is an alkyl halide having beta hydrogen on SP^3 hybridised carbon.

Hence, Correct option is (D).

13. Solution: (A)

Pd/BaSO_4 , quinoline is known as Rosenmund Reduction.