PAPER-4

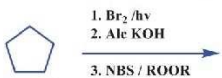
SECTION- I

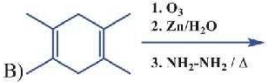
(ONE OR MORE THAN ONE)

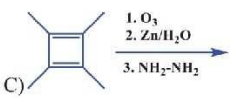
Each question has **FOUR** options for correct answer(s). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct option(s).
For each question, choose the correct option(s) to answer the question.
Answer to each question will be evaluated according to the following marking scheme:

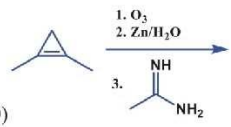
Full Marks:	+4 If only (all) the correct option(s) is (are) chosen.
Partial Marks:	+3 If all the four options are correct but **ONLY** three options are chosen.
Partial Marks:	+2 If three or more options are correct but **ONLY** two options are chosen, both of which are correct options.
Partial Marks:	+1 If two or more options are correct but **ONLY** one option is chosen and it is a correct option.
Zero Marks:	0 If none of the options is chosen (i.e. the question is unanswered).
Negative Marks:	-2 In all other cases.

1. Which among the following can yield the aromatic compound?

A) 

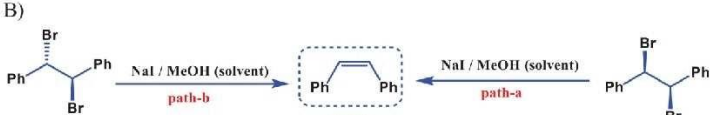
B) 

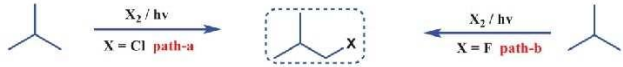
C) 

D) 

2. Which among the following **path b** is better than **path a** to achieve target molecule as a major product (Ph = phenyl group)

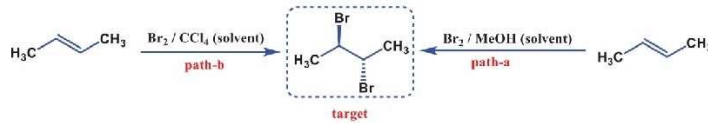
A) 

B) 



C)

D)



3. Consider the organic products obtained in the given reactions and choose the **INCORRECT** statement(s)

Consider each reaction gives 100% yield

A) In reaction-1 given alkene is cis, water addition is syn addition so product formed is meso

B) Two fractions obtained (consider only organic compounds) when we distilled out the product mixture of the reaction-1

C) Diastereomeric mixture formed in the reaction-2

D) Two fractions obtained (consider only organic compounds) when we distilled out the product mixture of the reaction-2

4. Compound B has molecular formula $C_6H_{10}O$ and does not possess any π bonds. When treated with con HBr, *cis*-1,4dibromocyclohexane is produced. Identify the structure of compound B.

A) 

B) 

C) 

D) 

5. Analyze the following data and choose the **CORRECT** option(s)

Compound [X]	**Compound [Y]**
M.F: C_4H_6O (acyclic compound)	M.F: C_4H_6O (acyclic compound)
Gives positive tollens test	Gives positive tollens test
Gives positive bromine water test	Gives positive bromine water test
Can show tautomerism	Cannot show tautomerism

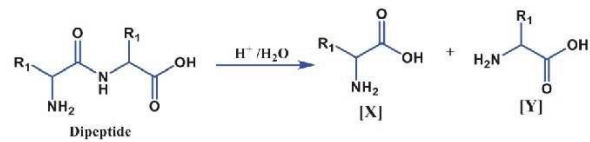
A) **[X]** & **[Y]** are positional isomers

B) **[Y]** is an aldol condensation product of acetaldehyde

C) **[X]** on treatment with D_3O^+ number of replaceable hydrogens with Deuterium is 4

D) **[X]** & **[Y]** are chain isomers

6. Analyze the following data of the following hydrolyzed products choose the correct options



If the dipeptide first treat with HNO_2 and thenhydrolysis is carried out we got lactic acid and **[Y]**. **[Y]** on heating gives 2,5-diketopiperazine.

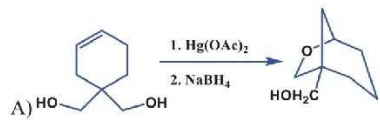
A) $R_1 = H$ & $R_2 = CH_3$

B) $R_1 = CH_3$& $R_2 = CH_3$

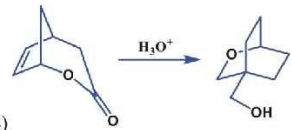
C) $R_1 = CH_3$& $R_2 = H$

D) $R_1 = H$ & $R_2 = H$

7. Among the following how many of them are correctly matched with its major product

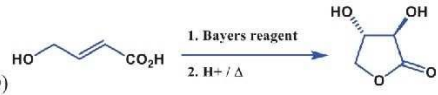


B)

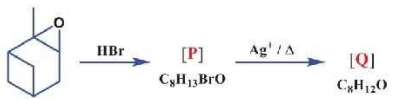


C)

D)



8. Choose the **CORRECT** option(s) among the following regarding given scheme



A) During the formation of **[P]** 3° carbocation rearranges to 2° carbocation

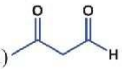
B) **[P]** is having five chiral centres

C) **[Q]** can show geometrical isomerism

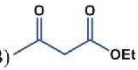
D) **[Q]** on reductive ozonolysis gives y which can show optical isomerism

9. How many of the following are more acidic than **acetyl acetone**?

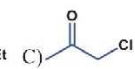
A)



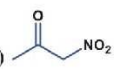
B)



C)



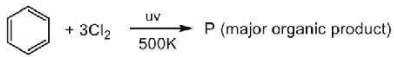
D)



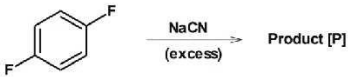
SECTION- II
(NUMERICAL VALUE)

The answer to each question is a **NUMERICAL VALUE**
For each question, enter the correct numerical value (in decimal notation, truncated/rounded off to the **second decimal place**; e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) designated to enter the answer.
Answer to each question will be evaluated according to the following marking scheme:
Full Marks: +3 IF **ONLY** the correct numerical value is entered as answer.
Zero Marks: 0 in all other cases.

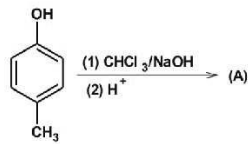
10. Number of -Cl atoms present in the Major organic product obtained in given reaction is?

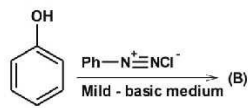


11. The rate law for the substitution reaction of optically pure 2-bromobutane with NaOH in 75% ethanol & 25% water at 30^0C is, $R = 3.6\times10^{-5}[2-\text{bromobutane}][OH^-] + 7.0\times10^{-6}[2-\text{bromobutane}]$. Assuming that SN^1&SN^2 reactions take place with 100% recemisation and 100% inversion respectively, find the ratio of percentage of inverted to retention products in 0.5M NaOH?

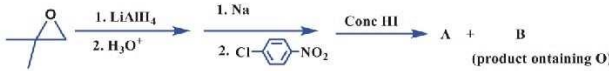
12. 

Find the dipole moment of product **[P]**

13. A) 

B) 

Double bond equivalent of A + B =

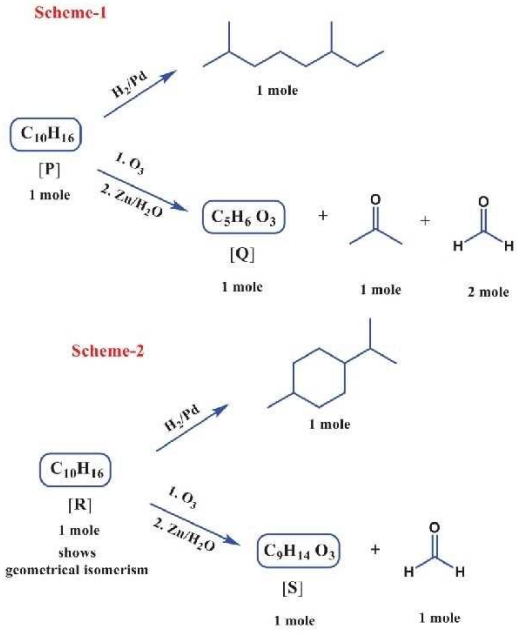
14. 

In the above reaction, the ratio of C to O in the molecular formula of B is ____.

SECTION – III
(COMPREHENSION TYPE)

This section contains Paragraphs Questions. Based on each paragraph, there are 2 or 3 questions. Each question has 4 options (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** option can be correct.
Marking scheme: +3 for correct answer, 0 if not attempted and -1 in all other cases.

Paragraph For Questions 15 & 16



15. Choose the **CORRECT** statement(s) regarding Scheme-1

A) **[P]** can show geometrical isomerism

B) **[Q]** can respond to the tollens reagent

C)**[Q]** contains two ketones and one aldehyde group

D) Number of carbon atoms in principal chain of **[Q]** is 5 (as per IUPAC)

16. Choose the **CORRECT** statement(s) regarding Scheme-2

A) **[R]** in scheme-2 is structural isomer of **[Q]** in scheme-1

B) **[R]** can show both geometrical as well as optical isomerim

C) **[S]** can show optical isomerim

D) **[S]** can respond to the iodoform test

ANSWERS

1	2	3	4	5	6	7	8	9	10
ABD	**ACD**	**ABCD**	**B**	**CD**	**C**	**ACD**	**A**	**AD**	**C**
11	12	13	14	15	16	17	18	19	20
6.14	**0**	**14**	**2**	**BD**	**ABCD**				