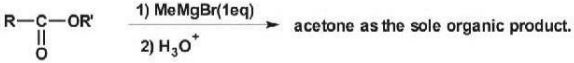
PAPER-10

SECTION- I

(ONE OR MORE THAN ONE)

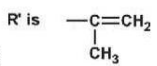
Each question has **FOUR** options for correct answer(s). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct option(s).
For each question, choose the correct option(s) to answer the question.
Answer to each question will be evaluated according to the following marking scheme:

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 is/are **CORRECTLY** matched with **R** and **R'** to have acetone as the sole organic product.

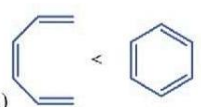
A) R is H-

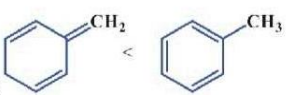
B) 

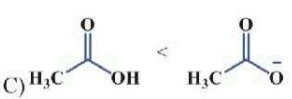
C) 

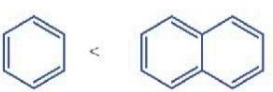
D) R' is CH_3

2. Which order among the following is/are **CORRECT** for the resonance energy?

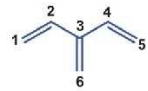
A) 

B) 

C) 

D) 

3. Identify the **INCORRECT** relation regarding to the bond length of the following molecule

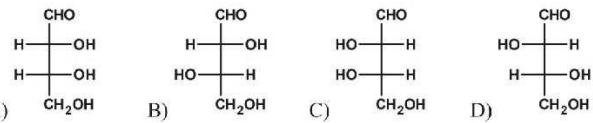


a = C_1–C_2 b = C_2 – C_3 c = C_3 – C_6

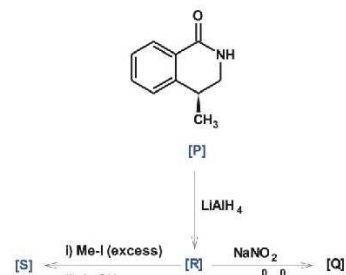
(where a, b and c represents bond lengths)

A) b>c>a B) c>b>a C) b>a>c D) c>a>b

4. An optically active aldotetrose which retains its optical activity with aqueous Br_2 but loses it with conc. HNO_3 has the following structure:



5. With reference to the scheme given below, which of the following statement(s) is/are **INCORRECT** about compounds **P,Q,R** and **S**?



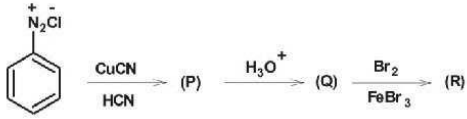
A) **[P]** release ammonia when boiled with concentrate NaOH solution

B) **[Q]** is a yellow oily liquid and is chiral

C) **[S]** shows geometrical isomerism

D) **[S]** on reaction with $NaNO_2$ / HCl gives a compound which two chiral centres.

6. In the following reaction sequence :



Find the 'True' statement :

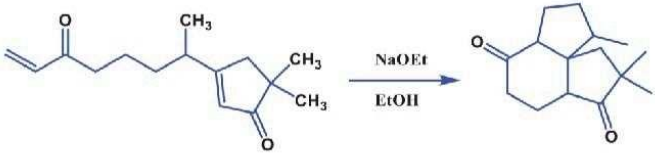
A) **[R]** is more acidic than **[Q]**

B) **[R]** is more reactive towards electrophilic aromatic substitution than **[Q]**

C) **[Q]** is more reactive towards electrophilic substitution than benzene

D) **[R]** on reaction with sodalime can form a compound which can undergo phenol formation with aq. NaOH treatment under normal condition of pressure and temperature

7. Identify **CORRECT** statement(s) about the following reaction?



A) It involves successive intramolecular aldol and conjugate nucleophilic addition reactions

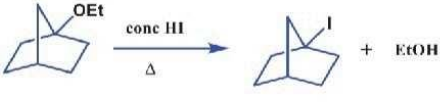
B) It involves two successive intramolecular Aldol reactions

C) It involves conjugate nucleophilic addition and acid base reaction

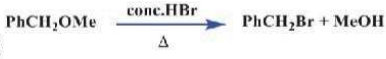
D) It involves successive nucleophilic addition and aldol reactions

8. Which of the following is/are correct reaction(s)? (consider dominant products)

A)



B)



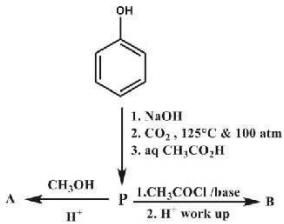
C)

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.

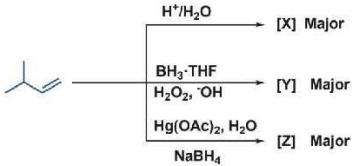
9.



In the above reaction, M_A , M_B and M_P are the molecular weights of **A, B** and **P** respectively.

What the value of $\left(\frac{M_A - M_B}{M_P - M_A}\right)$ is _____.

10.



How many of the following statements are correct with respect above scheme of reactions?

I) 'Z' is primary alcohol

II) 'Y' forms immediately turbidity with Lucas reagent

III) 'X' is 2° alcohol

IV) Both 'Y' and 'Z' are 2° alcohol

V) All (X, Y & Z) change the orange colour of acidified potassium dichromat green under normal conditions.

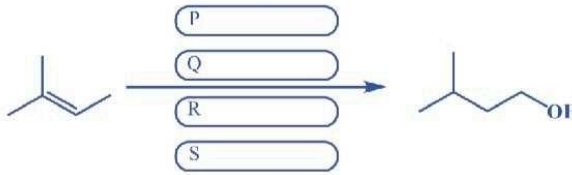
11. Number of sp^2 carbons in BENZYNE is 'p' and number sp-corbons in Benzyne i then the value of (p-q) is __

12. Isomeric alkenes of molecular formula C_5H_{10}each react with $Br_2/CHCl_3$,and given "n" number of dibromo products. Out of 'n' products, find the number of achiral isomers.

13. Choose the appropriate reagent sequence from the given reagents pool to complet the synthetic conversation. **Make sure to use strictly four reagents, not more n less.**

Note: you can simply mention the numerical values corresponding to the reagents the boxes **P, Q, R, S** respectively and also consider major organic product in each step.

What is the value of [P + Q + R –S]



1. **HBr**
2. **H^+/H_2O**
3. **$Hg(OAc)_2/H_2O$**
4. **BH_3·THF**
5. **EtONa/EtOH/Δ**
6. **HBr / ROOR /Δ**
7. **con H_2SO_4 / Δ**
8. **$NaBH_4$**
9. **H_2O_2, OH^-**
10. **t-BuOK/Δ**

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.

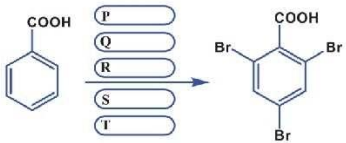
Choose the appropriate reagent sequence from the given reagents pool to complete the synthetic conversation given in the questions.

Make sure to use strictly all the boxes given on thearrow, not more not less

Note: you can simply mention the numerical values corresponding to the reagents in the boxes **P, Q, R, S**, and also in each stage consider major product.

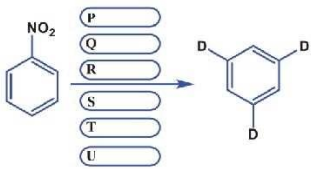
1. $HNO_3 + H_2SO_4$	6. H_2 / Pd-C	11. D_2O / D^+
2. CH_3Cl / $AlCl_3$	7. CuBr / HBr	12. H_2SO_4 / Δ
3. CuCN /HCN	8. CH_3COCl / base	13. H_3PO_2
4. Br_2 / H_2O	9. Mg / dry ether	14. NaOH + CaO / Δ
5. $NaNO_2$ / dil HCl (273K)	10. dil NaOH / Δ	15. CO_2 / H^+

14. What is the value of **[P + Q + 2R +S-T]**



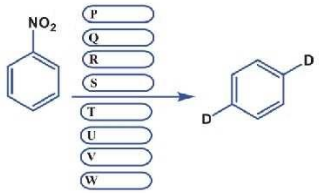
A) 12 B)5 C) 7 D)10

15. What is the value of **[P + Q + R +S-T-U]**



A) 6 B) 8 C) 10 D)12

16. What is the value of **[P + Q + R +S+T-U-V-W]**



A) 1 B) 9 C) 4 D) 6

ANSWERS

1	2	3	4	5	6	7	8	9	10
B	**ABCD**	**BCD**	**AC**	**ACD**	**A**	**C**	**BC**	**2**	**0**
11	12	13	14	15	16				
6	**0**	**11**	**C**	**B**	**D**				