

**TEST INFORMATION**

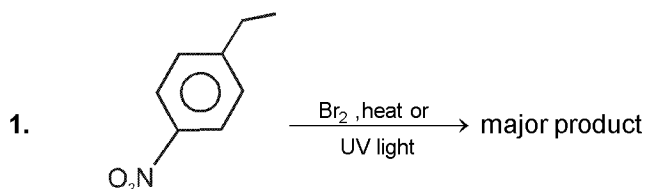
DATE : 06.05.2015

PART TEST (PT) - 04

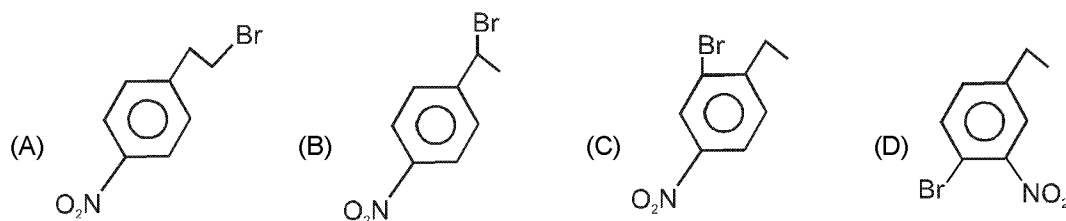
**Syllabus : Physical :** Atomic Structure, Nuclear chemistry, Chemical Kinetics, **Inorganic :** Qualitative Analysis, Metallurgy, d & f-block Elements.

**DPP No. # 09 (JEE-ADVANCED)**
**Total Marks : 169**
**Max. Time : 137 min.**

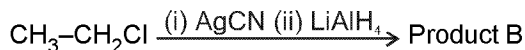
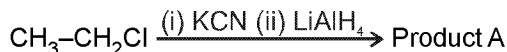
Single choice Objective (–1 negative marking) Q.1 to Q.15	(3 marks 2½ min.)	[45, 37½]
Multiple choice objective (–1 negative marking) Q.16 to Q.20	(4 marks, 3 min.)	[20, 15]
Assertion and Reason ('–1' negative marking) Q.21 to Q.23	(3 marks 2½ min.)	[09, 7½]
Comprehension (–1 negative marking) Q.24 to Q.32	(3 marks 2½ min.)	[27, 22½]
Single Digit Subjective Questions (no negative marking) Q.33 to Q.38	(4 marks 2½ min.)	[24, 15]
Double Digit Subjective Questions (no negative marking) Q.39 to Q.41	(4 marks 2½ min.)	[12, 7.5]
Match the column (4 vs 4) (no negative marking) Q.42	(8 marks, 8 min.)	[08, 08]
Match the column (4 vs 5) (no negative marking) Q.43 to Q.45	(8 marks, 8 min.)	[24, 24]



Major product is

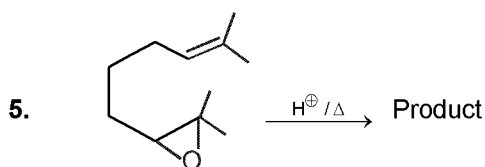
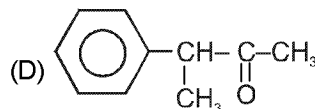
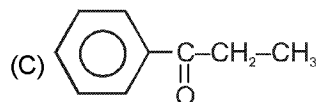
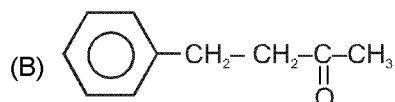
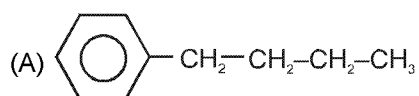
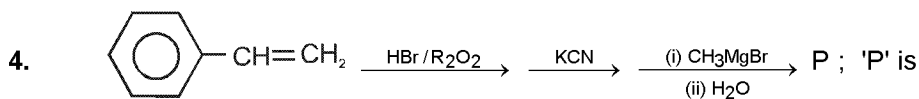
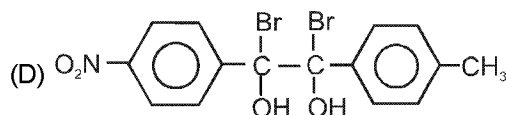
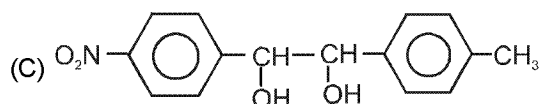
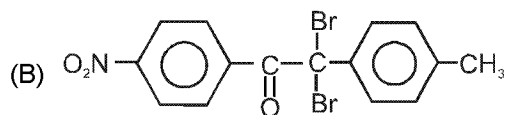
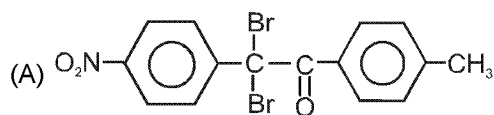
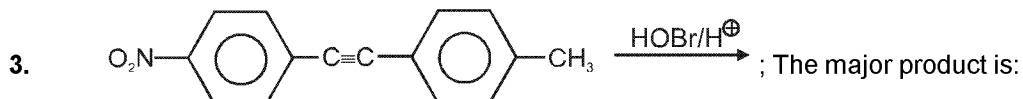


2. In the reactions given below :

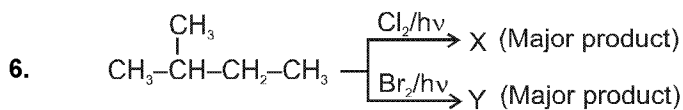
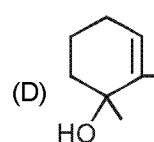
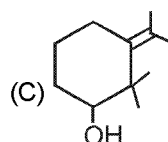
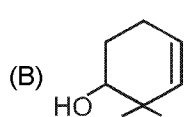
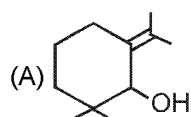


The compound A and B are :

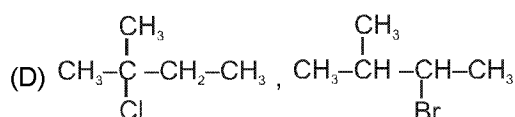
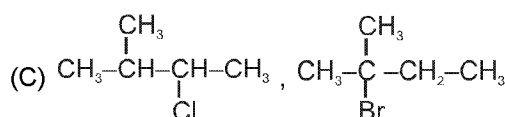
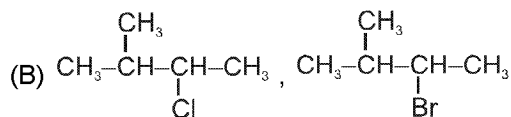
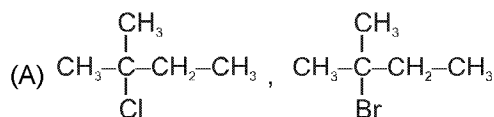
- (A) Chain isomers (B) Position isomers  
(C) Functional isomers (D) Metamers



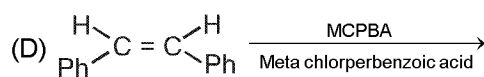
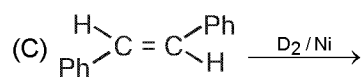
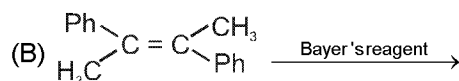
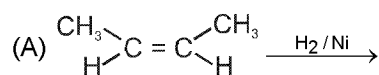
Product is:



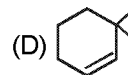
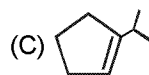
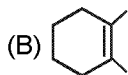
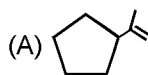
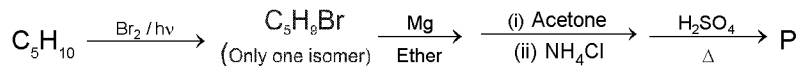
X and Y are respectively :



7. Which of these reaction gives meso compound as product ?



8. Identify the major product(P) of the following sequence of reaction.



9. The pair of compounds in which both the compounds give positive test with Tollen's reagent and Fehling solution is

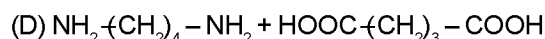
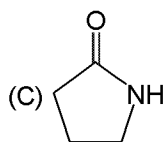
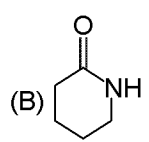
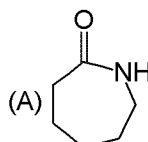
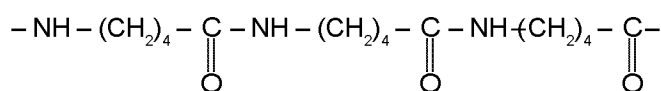
(A) Glucose and Sucrose

(B) Propanal and Benzaldehyde

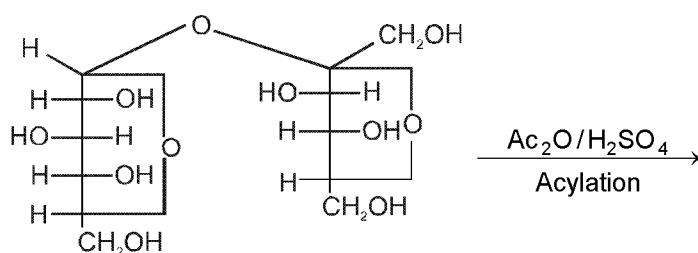
(C) Propanal and 2-Phenylethanal

(D) Benzaldehyde and 1-Hydroxypropanone

10. Which of the following is monomeric unit of the polymer Nylon-5 ?



11. Select the correct statements about the following



(i) sucrose forms an octaacetate

(ii) sucrose is nonreducing sugar.

(iii) sucrose is a polysaccharide

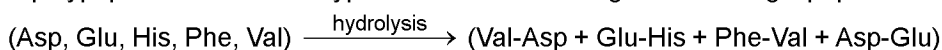
(A) (i), (ii)

(B) (i), (ii), (iii)

(C) (i), (iii)

(D) only (i)

12. A polypeptide contains five type of  $\alpha$ -amino acids. It gives following dipeptides only on hydrolysis.



The correct sequence of amino acids in the polypeptide is :

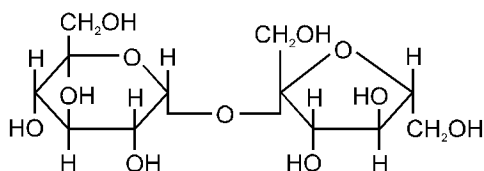
(A) Asp-Glu-His-Phe-Val

(B) Phe-Val-Asp-Glu-His

(C) Val-Asp-Glu-His-Phe

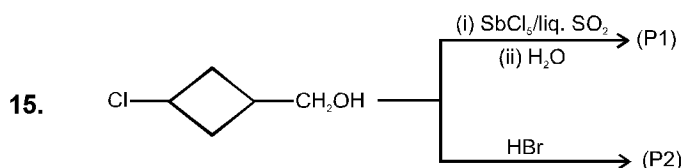
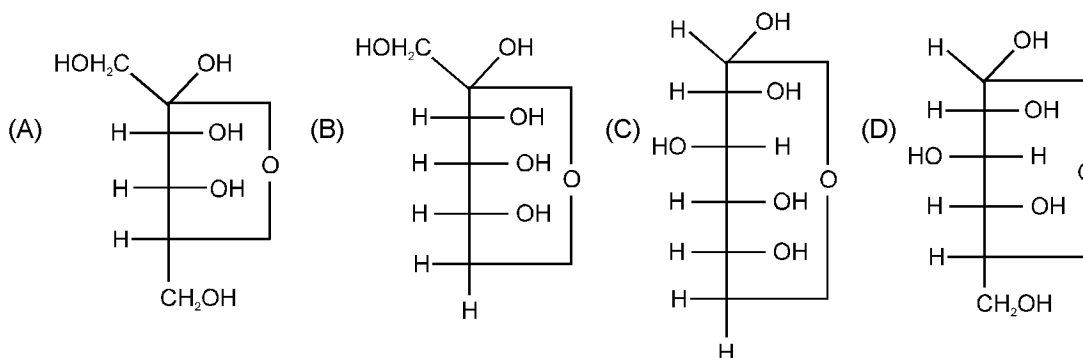
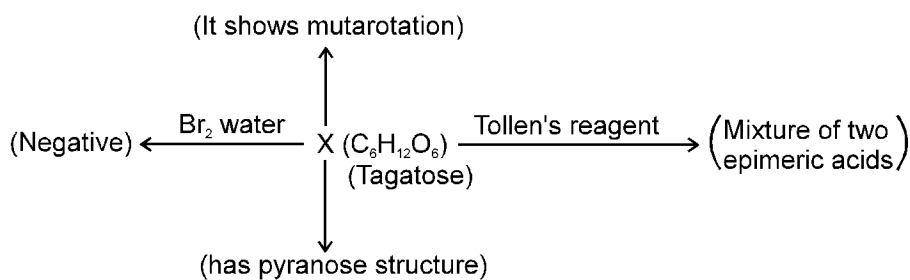
(D) Glu-His-Phe-Val-Asp-Glu-Val-Asp

13. The following compound on hydrolysis will give

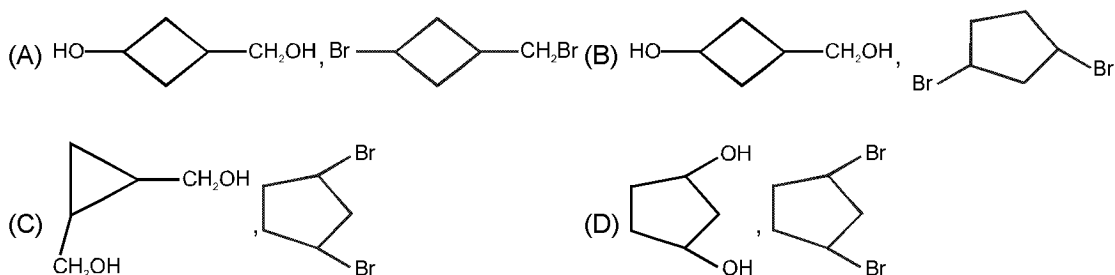


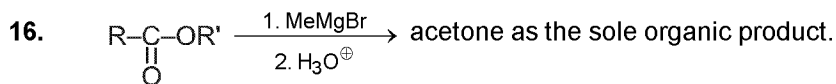
- (A) A pair of anomers  
(B) A pair of enantiomers  
(C) A pair of epimers  
(D) A pair of functional isomers

14. Observe the following road map and identify the carbohydrate 'X' (Tagatose)



P1 and P2 are respectively :

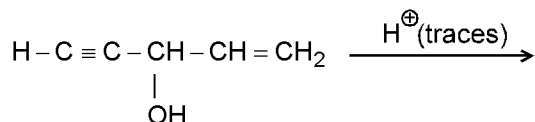




which is/are correctly matched with R and R'.

- (A) R = -H                      (B) R' =  $-\overset{\text{CH}_2}{\underset{\parallel}{\text{C}}}-\text{CH}_3$                       (C) R' =  $-\overset{\text{CH}_3}{\underset{\parallel}{\text{CH}}}-\text{CH}_3$                       (D) R = -CH<sub>3</sub>

17. Which of the following would be the significant product/s of the given reaction?

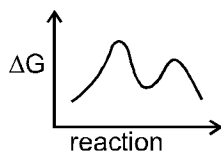


- (A)  $\text{CH}_2=\text{CH}-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{CH}=\text{CH}_2$                       (B)  $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}-\text{CHO}$   
 (C)  $\text{H}-\text{C}\equiv\text{C}-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{CH}_2-\text{CH}_3$                       (D)  $\text{CH}_2-\underset{\text{OH}}{\underset{|}{\text{CH}}}=\text{CH}-\text{C}\equiv\text{CH}$

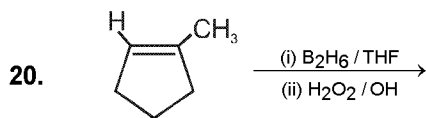
18. Select the chain propagation steps in the free radical chlorination of methane ?

- (A)  $\text{Cl}_2 \longrightarrow 2\dot{\text{Cl}}$                       (B)  $\dot{\text{C}}\text{H}_3 + \text{Cl}_2 \longrightarrow \text{CH}_3\text{Cl} + \dot{\text{Cl}}$   
 (C)  $\dot{\text{C}}\text{H}_3 + \dot{\text{Cl}} \longrightarrow \text{CH}_3-\text{Cl}$                       (D)  $\text{RO} + \text{CH}_4 \longrightarrow \text{ROH} + \dot{\text{C}}\text{H}_3$

19. Following graph between  $\Delta G$  and reaction progress represented by which of the following reaction ?



- (A) S<sub>N</sub>1 reaction                      (B) E<sub>1</sub> reaction  
 (C) Aromatic electrophilic substitution                      (D) Electrophilic addition reaction

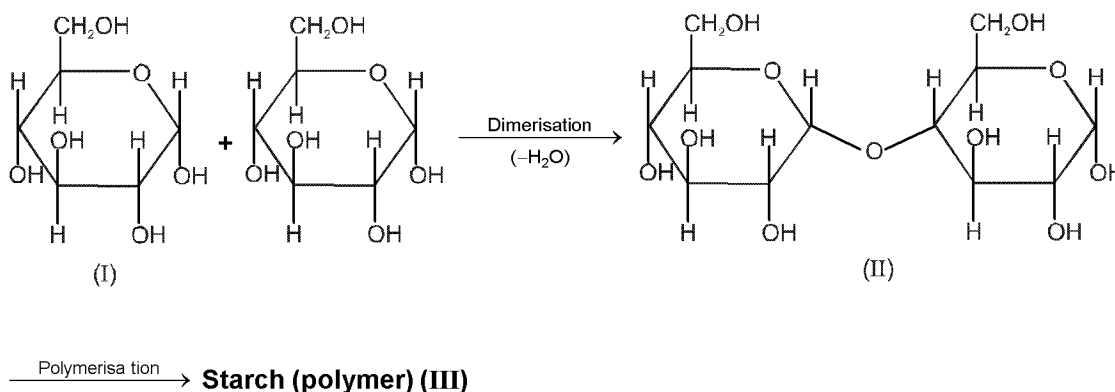


True statement about above reaction

- (A) Reagent involve stereospecific SYN addition of H and OH species  
 (B) Product obtained is trans isomer  
 (C) BH<sub>3</sub> acts as electrophile  
 (D) two stereoisomers are obtained as product.

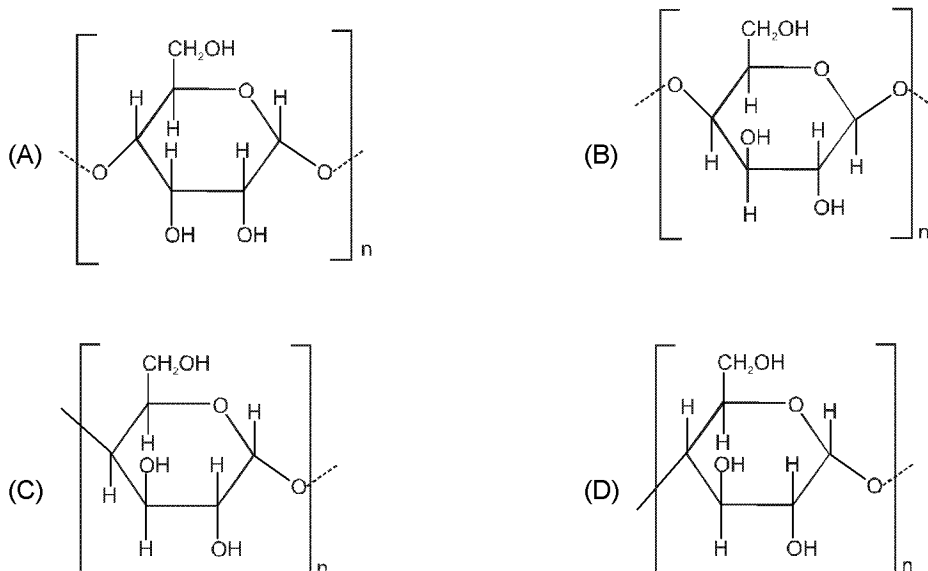
21. **STATEMENT-1** : 2-Bromobutane on heating with alcoholic KOH gives 3 isomeric alkenes which on treatment with  $\text{Br}_2/\text{CCl}_4$  give 5 products.  
**STATEMENT-2** : Stereochemical nature of elimination by alcoholic KOH and addition of  $\text{Br}_2$  is ANTI and SYN respectively.  
 (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.  
 (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.  
 (C) Statement-1 is True, Statement-2 is False.  
 (D) Statement-1 is False, Statement-2 is True.
22. **STATEMENT-1** : The rate of catalytic hydrogenation of ethyne at raney nickel (finely divided Ni) is faster than that of ethene.  
**STATEMENT-2** : Catalytic hydrogenation of ethyne to ethane is less exothermic than that of ethene to ethane.  
 (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.  
 (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.  
 (C) Statement-1 is True, Statement-2 is False.  
 (D) Statement-1 is False, Statement-2 is True.
23. **STATEMENT -1** : Hydrolysis of sucrose brings a change in sign of rotation towards plane polarised light.  
**STATEMENT -2** : Fructose has specific rotation  $-92.4^\circ$  and glucose has  $+52.5^\circ$   
 (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.  
 (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.  
 (C) Statement-1 is True, Statement-2 is False  
 (D) Statement-1 is False, Statement-2 is True

### Comprehension # 1

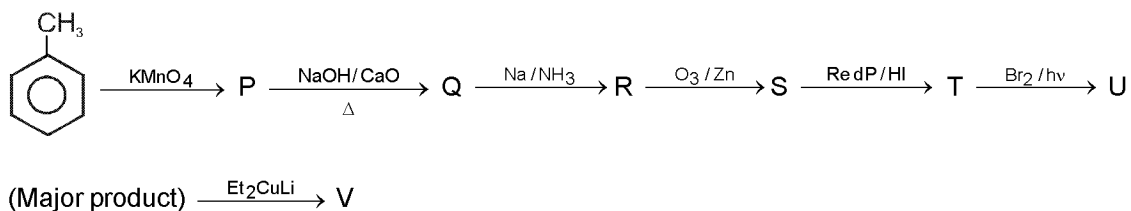


24. What is true about compound (I)  
 (A) It has an acetal structure  
 (B) It has tertiary hydroxy group  
 (C) It has a hemiacetal structure  
 (D) It's degree of unsaturation is two
25. Compound (II) is/has  
 (A) A polysaccharide  
 (B) Oligosaccharide  
 (C) Monosaccharide  
 (D) Hydrogen deficiency index is three

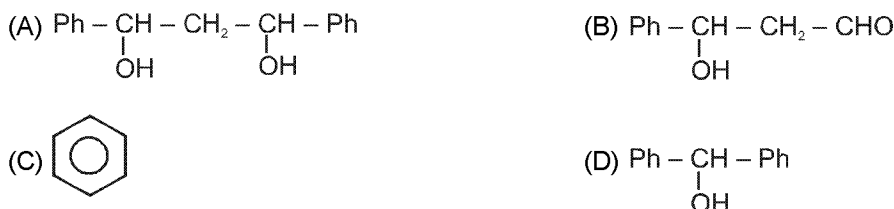
26. Assuming that polymerisation of (I) takes place in the manner similar to its dimerisation, then the structure of polymer (III) can be correctly represented as



## Comprehension # 2



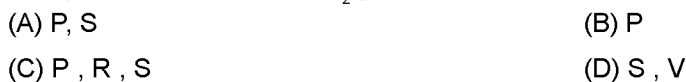
27. When 'S' reacted with  $\text{PhMgBr}$  the product formed is



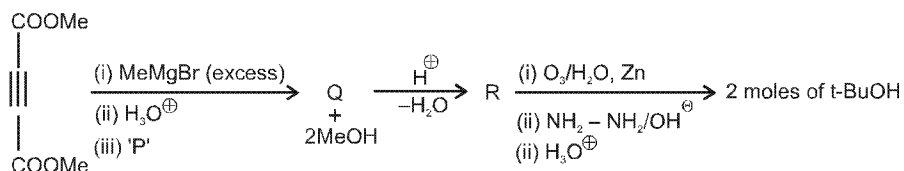
28. The total number of monochloro products of compound 'V' and the fractional distillation of product mixture respectively are :



29. Compounds which liberate  $\text{H}_2$  gas with Na metal are:



### Comprehension # 3

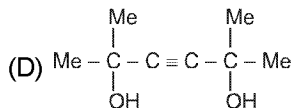
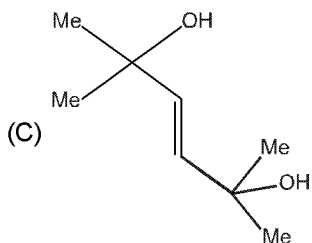
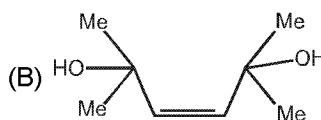
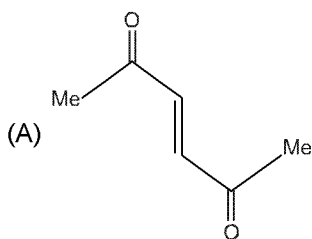


30. Reagent 'P' is :

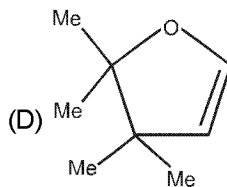
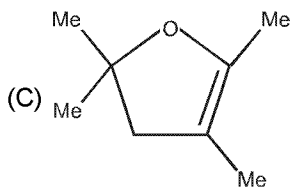
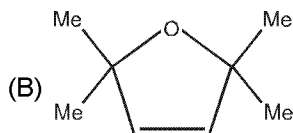
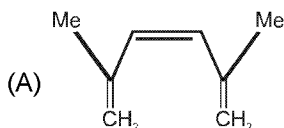
- (A)  $\text{Na/NH}_3 (\ell)$   
(C)  $\text{H}_2/\text{Ni}$

- (B)  $\text{H}_2$ , Pd-BaSO<sub>4</sub> (quinoline)  
(D)  $\text{NaBH}_4$

31. The structure of the product Q is :



32. The structure of R is :

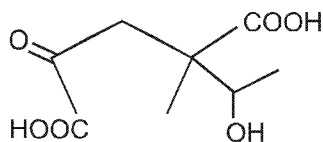


33. The sum of structural and diastereomers of a hydroxy compound  $\text{C}_4\text{H}_8\text{O}$ , formed by the substitution reaction of 3-chlorobut-1-ene with  $\text{AgNO}_3$  solution.

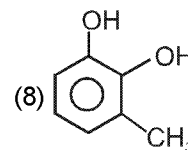
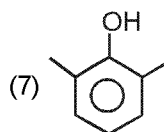
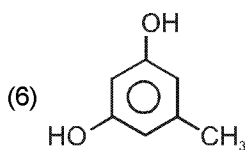
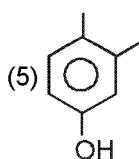
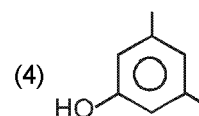
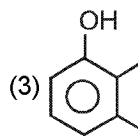
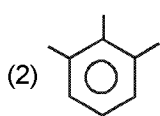
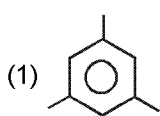
34. How many alkenes (be sure to consider the stereochemistry of the alkene) can be hydrogenated to form methyl cyclohexane.



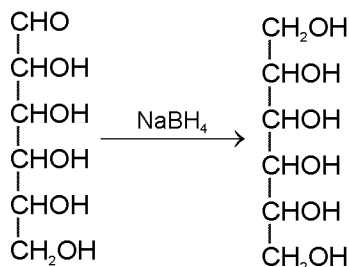
35. An optically active compound (M) on ozonolysis gives following structure in absence of zinc.



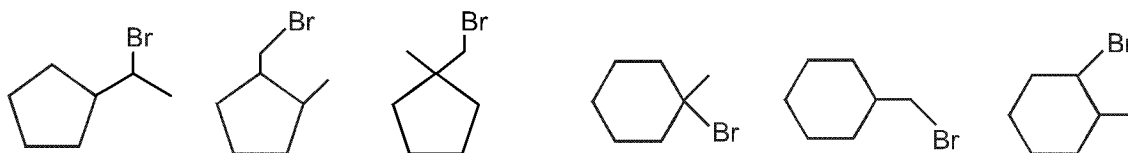
if (M) does not responds to  $\text{NaHCO}_3$  test, what product is obtained when (M) is heated in presence of conc.  $\text{H}_2\text{SO}_4$  as catalyst. Fill the number against product in key :



36. Lithium di(3-pentyl) cuperate on reaction with an alkyl bromide produces (X)  $\text{C}_7\text{H}_{16}$ . The mixture of all monochloro isomers formed from (X) are subjected to fractional distillation. Find the number of fractions obtained.
37. Observe the following reaction and find out that how many number of reactant stereoisomers can be reduced to optically inactive meso products.



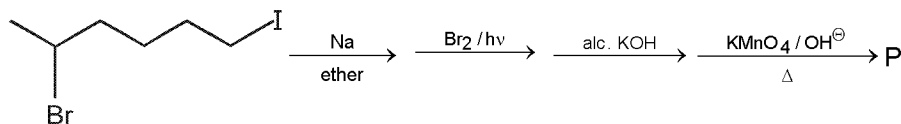
38. Among the 6, how many cyclic isomers of molecular formula  $\text{C}_7\text{H}_{13}\text{Br}$  can form 1-methylcyclohexane-1-ol on reaction with  $\text{H}_2\text{O}/\text{acetone}/\text{Ag}^+$ .



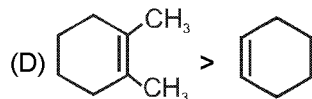
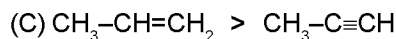
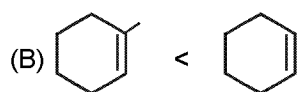
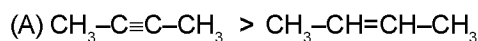
39. An undergraduate student heated 2-Cyclopentylethyl ethanoate at  $300^\circ\text{C}$  to obtain an unsaturated hydrocarbon "K" which was then treated with mercuric acetate followed by water then sodium Borohydride to give "L" which is dehydrated by concentrated  $\text{H}_2\text{SO}_4$  at  $180^\circ\text{C}$  to give "M" as major product. Find molecular mass of compound "M"

40. Ozonolysis of next higher homolog of simplest alkene in presence of zinc yields (A) and (B). (A) gives positive iodoform test while (B) does not. (A) when treated with excess of (B) in NaOH solution gives (C) and (D) as final product after acidification. If "C" gives positive  $\text{NaHCO}_3$  test then calculate molecular mass of (D). Report your answer as molecular mass divided by 4.

- 41.** Observe the following sequence of reactions and report your answer as molecular weight/10.



- 42. Column – I**



- Column – II**

- (p) Rate of HBr addition

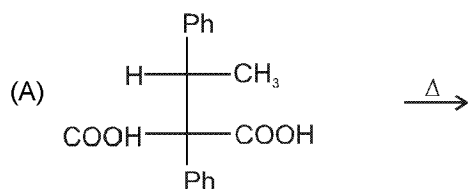
- (q) Rate of  $H_2$  addition

- (r)  $\Delta H$  of hydrogenation

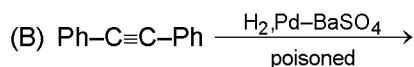
- (s)  $\Delta H$  of combustion

- 43.** Match the reactions given in column I with their properties listed in column II.

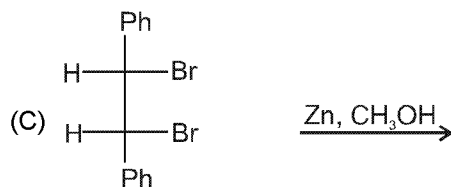
- Column – I**



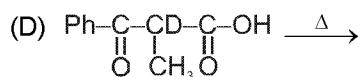
- (p) Anti elimination



- (q) stereoselective



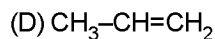
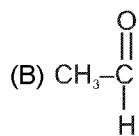
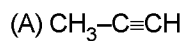
- (r) Optical diastereomers



- (s)  $\text{CO}_2$  will evolve

- (t) Racemic mixture

44. Column-I



Column-II

(p) Undergoes oxidation

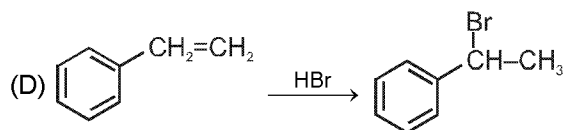
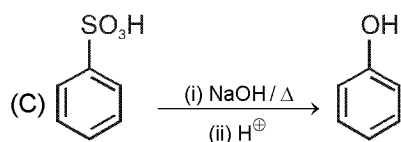
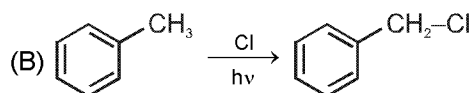
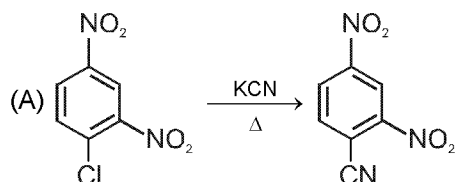
(q) Undergoes reduction

(r) Gives ppt. with  $\text{AgNO}_3/\text{NH}_4\text{OH}$

(s) Can be reduced with help of  $\text{H}_2/\text{Pt}$  (catalytic hydrogenation)

(t) more acidic than water

45. Column-I



Column-II

(p) Substitution reaction

(q) Free radical reaction

(r) Nucleophile is the attacking species.

(s) Electrophile is the attacking species.

(t) Addition reaction.