



# CHEMISTRY

## BOOKS - MS CHOUHAN CHEMISTRY (HINGLISH)

### FAMILIES OF CARBON COMPOUNDS: FUNCTIONAL GROUPS AND INTERMOLECULAR FORCES

**Solved Problem**

1. Compare the dipole moments of water and ammonia.



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2. Explain why cis-1,2-dichloroethene (Table 2.1) has a large dipole moment whereas trans-1,2-dichloroethene has a dipole moment equal to zero.



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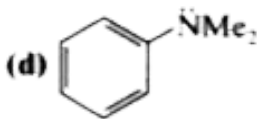
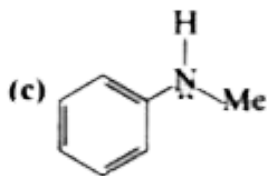
3. Write bond-line structural formulas for (a) two primary (b)  $CH_3CHCH_2CH_3$  alcohols, a secondary alcohol, and (e) a tertiary alcohol - all having the molecular formula  $C_4H_{10}O$



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4. One way of naming amines is to name in alphabetical order the alkyl groups attached to the nitrogen atom, using the prefixes di- and tri- if the groups are the same. An example is isopropylamine whose formula is shown

above. What are names for (a), (b), (c), and (d)?



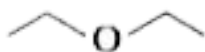
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5. When formic acid donates the proton from its oxygen to a base, a formate ion is the result. Write another resonance structure for formic acid and for the formate ion. Which species, formic acid or the formate ion, would be most stabilized by resonance?

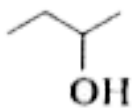


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6. Arrange the following compounds according to their expected boiling points, with the lowest boiling point first, and explain your answer. Notice that the compounds have similar molecular weights.



**Diethyl ether**



**sec-Butyl alcohol**



**Pentane**



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7. Compare the dipole moments of water and ammonia.



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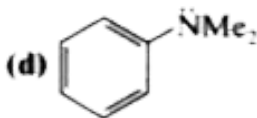
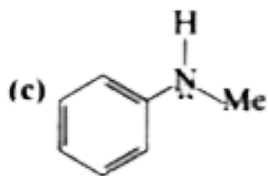
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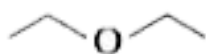
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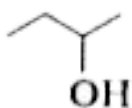


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12. Arrange the following compounds according to their expected boiling points, with the lowest boiling point first, and explain your answer. Notice that the compounds have similar molecular weights.



**Diethyl ether**



**sec-Butyl alcohol**



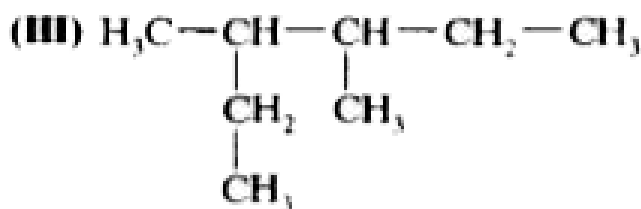
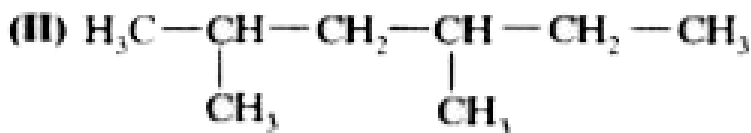
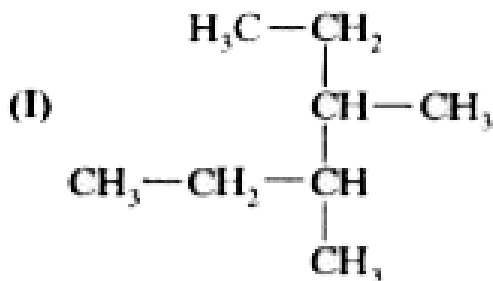
**Pentane**



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# Additional Objective Questions Single Correct Choice Type

1. Which of the following structures represent the same compound?



A. (I) and (II)

B. (II) and (III)

C. (I) and (III)

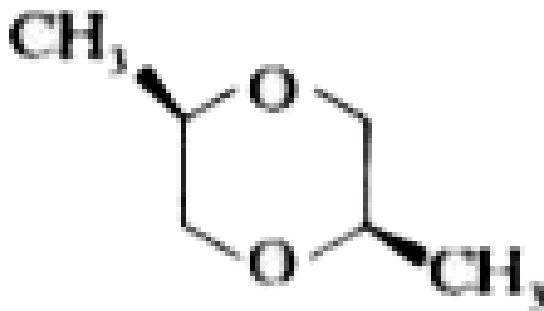
D. All are same

**Answer: C**



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2. How many types of functional groups are present in the given compound?

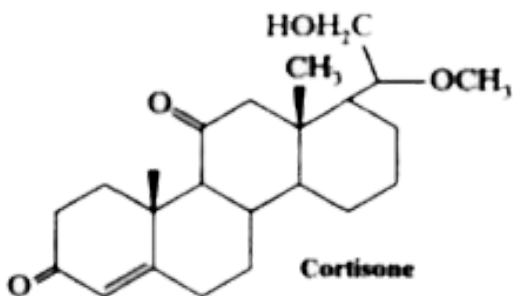


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3. The correct order of the solubility of the different alcohols in water is

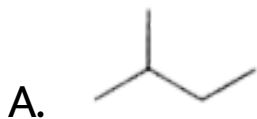
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4. The functional groups in cortisone are



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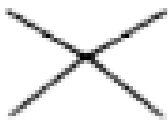
5. Which of the following alkanes will have the lowest boiling point ?



B.



C.



D.

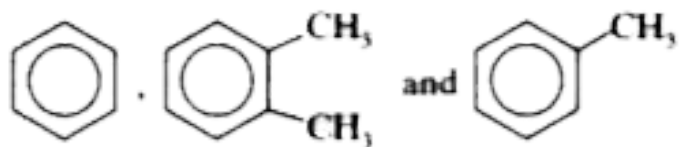


**Answer: C**



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**6.** Number of secondary carbon atoms present in the given compounds is respectively:

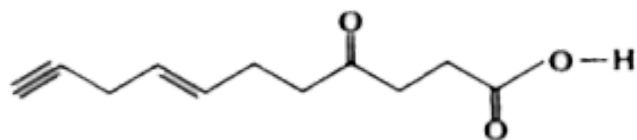


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7. Which of the following has the greatest dipole moment?

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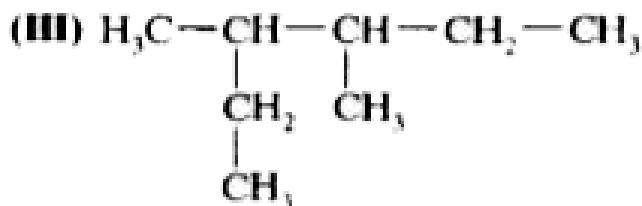
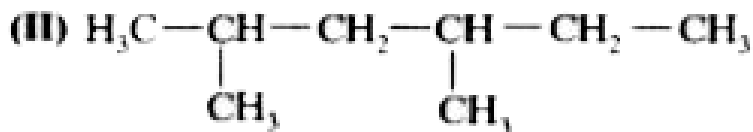
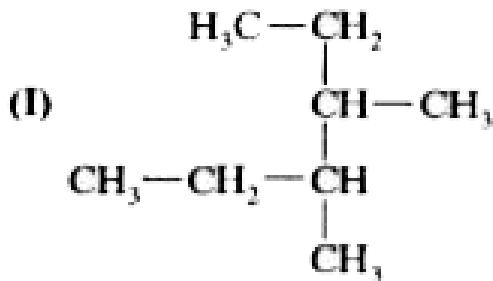
8. Number of functional groups in the given compound is



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9. Which of the following structures represent the same compound?





A. (I) and (II)

B. (II) and (III)

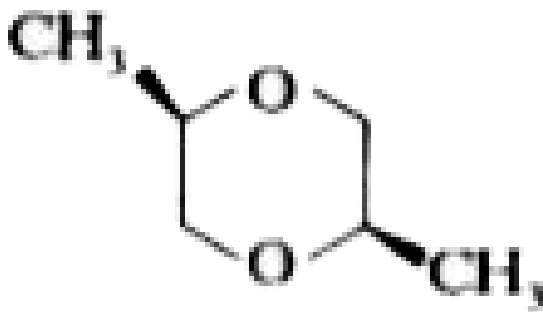
C. (I) and (III)

D. All are same

**Answer: C**

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**10.** How many types of functional groups are present in the given compound?

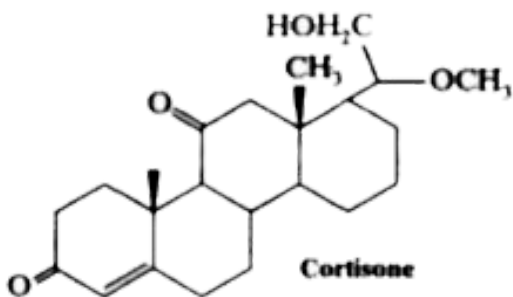


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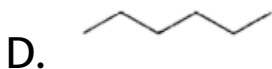
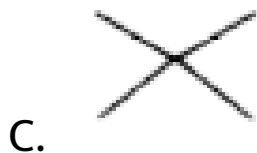
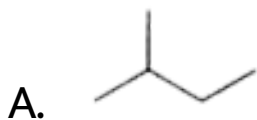
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12. The functional groups in cortisone are



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13. Which of the following alkanes will have the lowest boiling point ?

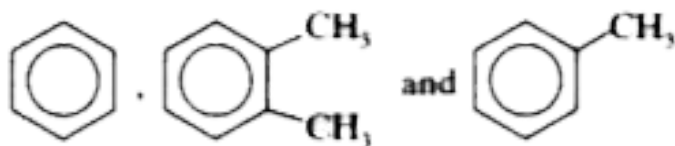


**Answer: C**



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14. Number of secondary carbon atoms present in the given compounds is respectively:

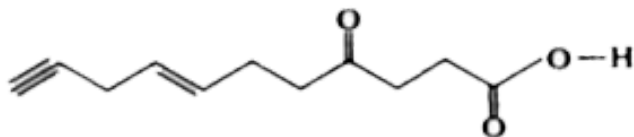


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15. Which of the following has the greatest dipole moment?

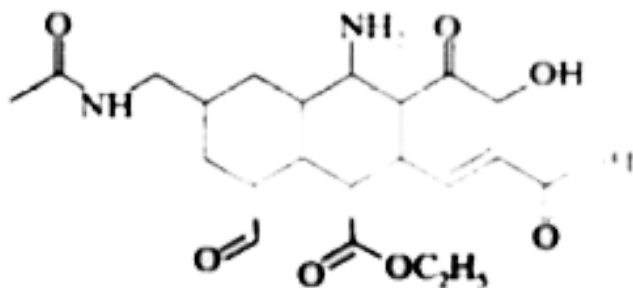
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16. Number of functional groups in the given compound is



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Additional Objective Questions Integer Type

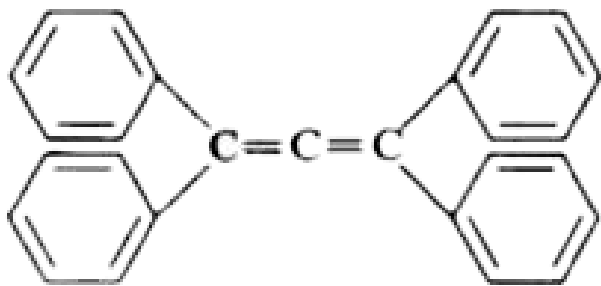


1.

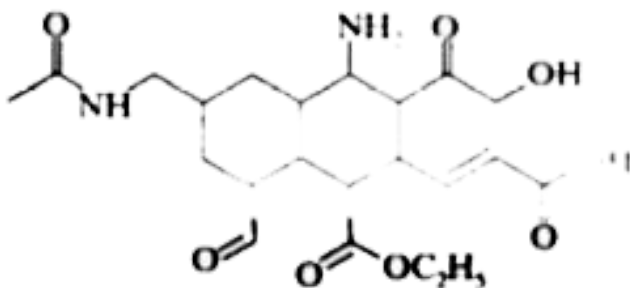
Sum of total number of functional groups present in the given compound is

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2. How many 2° carbon are present in the following compound?



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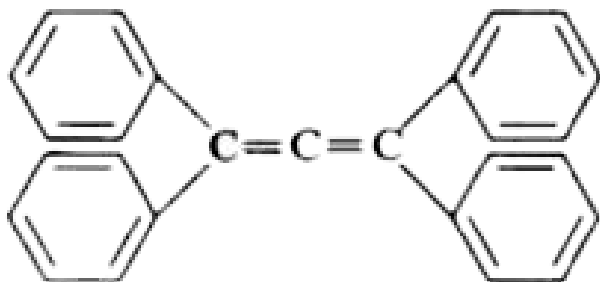
3.

Sum of total number of functional groups present in the given compound is

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4. How many  $2^\circ$  carbon are present in the following compound?

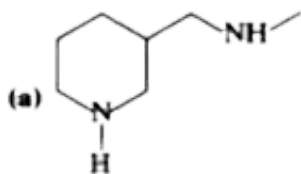


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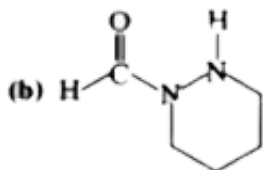
Additional Objective Questions Matrix Match  
Type

**Column I (Compound)**

**Column II (Type)**

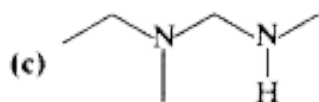


(p) 1° Amine

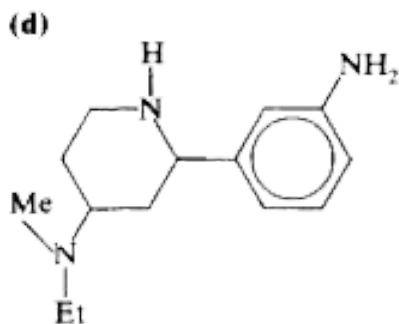


(q) 2° Amine

1.



(r) 3° Amine



(s) 1° Carbon

(t) 2° Carbon



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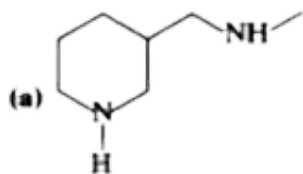
Column-I	Column-II
(a) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{CH}_3$	(p) Dipole ( <i>cis</i> > <i>trans</i> )
(b) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{CN}$	(q) Dipole ( <i>trans</i> > <i>cis</i> )
(c) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{Cl}$	(r) Melting point ( <i>trans</i> > <i>cis</i> )
(d) $\text{Cl}-\text{CH}=\text{CH}-\text{Cl}$	(s) Boiling point ( <i>cis</i> > <i>trans</i> )

2.

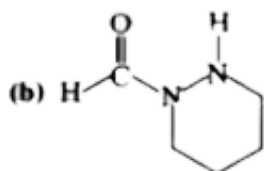


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Column I (Compound)	Column II (Type)
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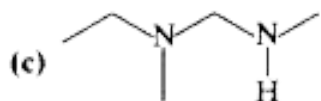


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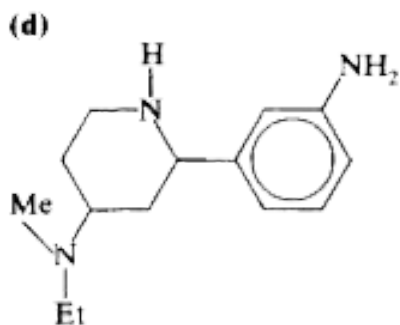


(q) 2° Amine

3.



(r) 3° Amine



(s) 1° Carbon

(t) 2° Carbon



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Column-I	Column-II
(a) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{CH}_3$	(p) Dipole ( <i>cis</i> > <i>trans</i> )
(b) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{CN}$	(q) Dipole ( <i>trans</i> > <i>cis</i> )
(c) $\text{H}_2\text{C}=\text{CH}=\text{CH}-\text{Cl}$	(r) Melting point ( <i>trans</i> > <i>cis</i> )
(d) $\text{Cl}-\text{CH}=\text{CH}-\text{Cl}$	(s) Boiling point ( <i>cis</i> > <i>trans</i> )

4.



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