

## CASE STUDY QUESTION 18

**Read the following and answer any four questions from (i) to (v)**

A hydrocarbon is an organic chemical compound composed exclusively of hydrogen and carbon atoms. Hydrocarbons are naturally-occurring compounds and form the basis of crude oil, natural gas, coal, and other important energy sources.

Hydrocarbons are highly combustible and produce carbon dioxide, water, and heat when they are burned. Therefore, hydrocarbons are highly effective as a source of fuel.

Study the table related to three hydrocarbons P, Q, R and answer the questions that follow.

Organic Compound	Molecular formula
P	$C_3H_8$
Q	$C_5H_{10}$
R	$C_4H_6$

(i) P, Q and R are classified as hydrocarbons because

- (a) they contain carbon
- (b) they contain hydrogen
- (c) they contain both carbon and hydrogen
- (d) none of these.

P, Q and R are classified as hydrocarbons because these compounds are made up of carbon and hydrogen only.

**Ans: (c) they contain both carbon and hydrogen**

(ii) Which of these organic compounds is an alkyne?

- (a) P
- (b) Q
- (c) R
- (d) Both P and Q

**Ans: (c) R is an alkyne**

(iii)  $C_3H_8$  belongs to

- (a)  $C_nH_{2n+2}$  series
- (b)  $C_nH_{2n}$  series
- (c)  $C_nH_{2n-2}$  series
- (d) none of these.

**Ans: (a)  $C_nH_{2n+2}$  series**

(iv) Identify the incorrect statement about these three hydrocarbons.

(a) All have different general formula.

(b) P, Q both differ by  $-\text{CH}_2$  unit.

(c) P is an alkane.

(d) Q is an alkene.

**Ans: (b) P, Q both differ by  $-\text{CH}_2$  unit.**

(v) General formula for alkyne is

(a)  $\text{C}_n\text{H}_{2n}$

(b)  $\text{C}_n\text{H}_{2n+2}$

(c)  $\text{C}_n\text{H}_{2n-2}$

(d)  $\text{C}_n\text{H}_n$

**Ans: (c)  $\text{C}_n\text{H}_{2n-2}$**