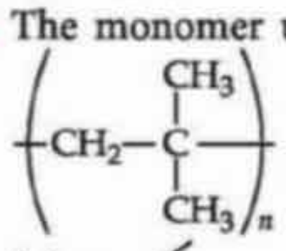
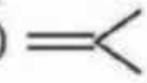
9. Which one of the following is a non-steroidal hormone?
(a) Estradiol
(b) Prostaglandin
(c) Progesterone
(d) Estrone

10. Which of the following statements indicates the cyclic structure of glucose?
(a) Glucose gets oxidised to gluconic acid on reaction with bromine water.
(b) Glucose on heating with HI forms *n*-hexane.
(c) Glucose does not give 2, 4-DNP test.
(d) All of the above.

11. Which of the following reactions takes place in fusion zone in the blast furnace during the extraction of iron?
(a) $CaCO_3 \longrightarrow CaO + CO_2$
(b) $CO_2 + C \longrightarrow 2CO$
(c) $C + O_2 \longrightarrow CO_2$
(d) $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$

12. The monomer unit for the following polymer is



(a) 
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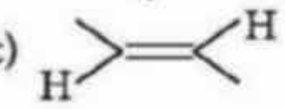
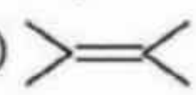
(c) 
(d) 

Some Facts Behind the Chemistry of Insect Repellents

Insect repellents are used to repel mosquitoes, ticks, flies and other biting insects. These repellents affect an insect senses such as smell and taste to prevent it from finding a human or animal host.

WHAT ATTRACTS INSECTS?

1-Octen-3-ol

MOLECULAR FORMULA

$C_8H_{16}O$

This chemical is present in human sweat and breath, and is thought to attract biting insects such as mosquitoes. It is often used in combination with CO_2 in mosquitoes traps. It is also known as mushroom alcohol because it is found in mushrooms.

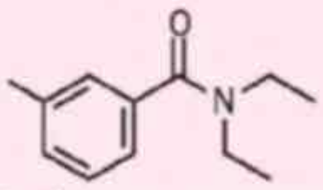
COMMON INGREDIENTS IN INSECT REPELLENTS

DEET

***N, N*-Diethyl-meta-toluamide**

MOLECULAR FORMULA

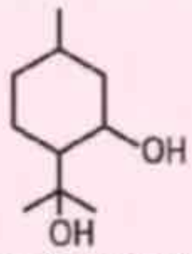
$C_{12}H_{17}NO$



- It is the most common active ingredient.
- 2-8 hours protection (20-30% solution).
- 10-30% solution safe for adults. <10% recommended for children up to 12.
- Effective for mosquitoes, ticks, flies and other biting insects.

CITRIODIOL

***p*-Menthane-3, 8-diol**



MOLECULAR FORMULA

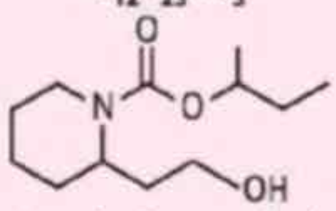
$C_{10}H_{20}O_2$

- It is obtained from citriodora of the lemon eucalyptus tree.
- Approximately 6 hours protection (10-20% solution).
- No adverse effects - irritation possible if contact with eyes occurs.
- Mosquitoes, flies and gnat repellent; also a miticide, killing insects and mites.

ICARIDIN OR PICARIDIN

MOLECULAR FORMULA

$C_{12}H_{23}NO_3$



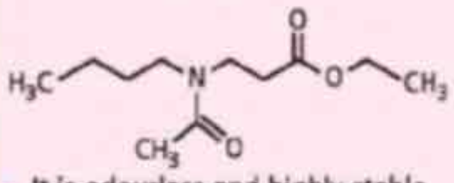
- It is odourless and doesn't damage plastics.
- 2-8 hours protection (20% solution.)
- Used on human skin or clothing. These products may be pumps sprays, liquids, aerosols or wipes.
- Not a skin irritant, but can cause mild eye irritation on contact.
- Repels mosquitoes, ticks and chiggers.

IR3535

Ethyl butylacetylamino propionate

MOLECULAR FORMULA

$C_{11}H_{21}NO_3$



- It is odourless and highly stable.
- 7 hours protection (10-20% solution.)
- Not harmful when ingested or inhaled, although can irritate eyes on contact.
- Repels mosquitoes, ticks, body lice and biting flies.

HOW DO INSECT REPELLENTS WORK?

Unpleasent odour of repellents confuses insects by jamming their olfactory receptors which produces repellent effect.

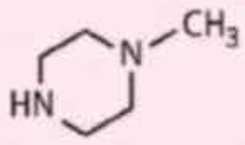
Recent studies suggest that, after initially being exposed to the repellent DEET, insects can temporarily overcome or develop resistance to its repellent effect. This could have future implications for how the efficacy of repellents is determined.

AN INVISIBLE BUT A BUILT IN DEFENCE?

1-Methylpiperazine

MOLECULAR FORMULA :

$C_5H_{12}N_2$



Researchers showed that bacteria on human skin form 1-methylpiperazine that prevents mosquitoes from recognising presence of human.