

Model Answers: Easy

1

The correct answer is **A** because:

- Nicotine is a naturally occurring alkaloid compound produced by the **tobacco** plant which is highly **addictive** in humans, where it acts as a stimulant
- Nicotine influences reward centres in the brain, stimulating the release of **dopamine** from synapses, causing pleasurable experiences which are highly addictive

B is incorrect as	carbon monoxide binds almost irreversibly with haemoglobin, reducing oxygen saturation of the blood.
C is incorrect as	THC (tetrahydrocannabinol) is the main psychoactive compound in cannabis.
D is incorrect as	tar is a mixture of compounds (some of which are carcinogens) which settle on the lining of the airways of the lungs.

2

The correct answer is **C** because nicotine is a drug that stimulates the nervous system to reduce the diameter of arterioles (narrowing the arteriole lumen) which increases blood pressure.

A is incorrect as	carbon monoxide binds almost irreversibly with haemoglobin, reducing oxygen saturation of the blood.
B is incorrect as	carbon dioxide is not relevant here.
D is incorrect as	tar is a mixture of compounds (some of which are carcinogens) which settle on the lining of the airways of the lungs.

3

The correct answer is **D** because haemoglobin has the highest affinity for carbon monoxide, binding irreversibly to form carboxyhaemoglobin. Oxygen binds reversibly with haemoglobin (forming oxyhaemoglobin); oxygen readily combines in this way and each haemoglobin molecule can carry 4 oxygen molecules. Carbon dioxide can combine with the terminal amine groups of some haemoglobin molecules, forming caraminohaemoglobin. The affinity of haemoglobin for oxygen is much greater than for carbon dioxide.

4

The correct answer is **D** because:

- Nicotine is a naturally occurring alkaloid compound produced by the **tobacco** plant which is highly **addictive** in humans, where it acts as a stimulant
- It does not directly damage the gas exchange system, whereas tar contains carcinogens and directly causes COPD by irritating the lining of the lungs

5

The correct answer is **A** because:

- Nicotine has an adverse effect on platelets, increasing the likelihood of them sticking together
- This increases the risk of thrombosis (blood clotting)