

CCT Weekly- Science Practice

UNIT-I:- The Case of Stubble Burning

It is that time of the year again. Farm fires are back and on the rise. The air quality of Delhi is deteriorating every day and residents are struggling to breathe. Delhi recorded its worst air quality since February (on October 12, 2020) as the concentration of fine particulate matters PM_{2.5} and PM₁₀ increased to their highest recorded levels this season.

A news report from

<https://www.indiatoday.in/india/story/stubble-burning-delhi-air-quality-farm-fires-farmers-blame-govt-solution-1731109-2020-10-13>

Question 1:

The burning of crop residue across farms in the country results in the poor air quality in nearby locations. Which of the following are produced during this burning of crop residue?

- (a) Carbon dioxide (CO₂), Carbon Monoxide (CO) and Particulate matter
- (b) Carbon dioxide (CO₂), Carbon Monoxide (CO) and Sulphur Oxides (SO_x),
- (c) Carbon dioxide (CO₂), Carbon Monoxide (CO), Sulphur Oxides (SO_x), Particulate matter and Carbon particles
- (d) Carbon dioxide (CO₂), CO, Sulphur Oxides (SO_x) and Particulate matter

Question 2:

The impacts of crop residue burning are immediate as well as long term. Besides the increase in air pollution and resulting respiratory problems, which one of the following according to you are the immediate noticeable impacts?

- i. **Depletion of soil nitrogen, phosphorus, potassium**
 - ii. **Ozone layer depletion**
 - iii. **Loss of microorganisms of the upper layer of the soil**
 - iv. **Climate change**
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- (a) i, ii, iv
 - (b) I and iii,
 - (c) i, ii and iii
 - (d) ii and iii

Question 3:

The burning of crop residue produces a lot of carbon particles. What happens to these carbon particles that are released in air?

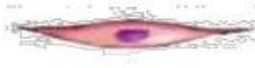
- (a) Carbon particles dissolve in the rain to cause acid rain
- (b) Carbon particles settle on the surrounding trees/ soil
- (c) Carbon particles are used by plants and trees
- (d) Carbon particles are gaseous so they fly afar

UNIT-II:- MUSCLE

Muscle tissue is a specialized tissue found in animals which functions by contracting, thereby applying forces to different parts of the body. Muscle tissue consists of fibers of muscle cells connected together in sheets and fibers. Together these sheets and fibers are known as muscles.

Muscle tissue can be used to move bones, compress chambers, or squeeze various organs. These different types of muscle tissue are discussed below.

Comparison of Muscle Types

Muscle Type	Skeletal	Cardiac	Smooth
Location	Attached to bone	Heart	Walls of internal organs + in skin
Function	Movement of bone	Beating of heart	Movement of internal organs
Control Mode	Voluntary	Involuntary	Involuntary
Shape	Long + slender 	Branching 	Spindle shape 
Characteristics	Striated- light and dark bands Many nuclei	Striated One or two nuclei	Non-striated One nucleus (visceral)

Question 4:

Which type of muscle is present in our tongue?

- a) Skeletal muscles
- b) Cardiac muscles
- c) Smooth muscles
- d) Both a and c

Question 5:

Unstriated muscles are present in which of the following organs?

- a) Wall of intestine
- b) Leg muscles
- c) Heart wall
- d) Finger muscles

Question 6:

Uninucleate muscles are_____.

- a) Skeletal muscles
- b) Striated muscles
- c) Voluntary muscles
- d) Smooth muscles

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Answer:

1. (c)
2. (b)
3. (b)
4. (a)
5. (a)
6. (d)

Environmental and health risk of crop residue burning

It is estimated that crop residue burning releases millions of tonnes of carbon dioxide, over carbon monoxide (CO) along with oxides of sulphur, particulate matter and million tonnes of black carbon. These directly contribute to environmental pollution, and are also responsible for the haze in Delhi and melting of Himalayan glaciers.

The heat from burning paddy straw penetrates 1 centimetre into the soil, elevating the temperature to 33.8 to 42.2 degree Celsius. This kills the bacterial and fungal populations critical for a fertile soil. Burning of crop residue causes damage to other micro-organisms present in the upper layer of the soil as well as its organic quality. Due to the loss of 'friendly' pests, the wrath of 'enemy' pests has increased and as a result, crops are more prone to disease. The solubility capacity of the upper layers of soil has also been reduced.

According to a report, one tonne stubble burning leads to a loss of 5.5 kilogram nitrogen, 2.3 kg phosphorus, 25 kg potassium and more than 1 kg of sulfur — all soil nutrients, besides organic carbon.

<https://www.downtoearth.org.in/blog/agriculture/stubble-burning-a-problem-for-the-environment-agriculture-and-humans-64912>