
10. AIR AROUND US - INTRODUCTION

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

1. The presence of which of these components in air varies from place to place
(FA & SA- 2 Marks)

A) oxygen B) Nitrogen C) Carbon dioxide D) water vapour

Answer:D

Solution: Water vapor content varies with humidity, temperature, and location.

2. Which of these is not an organ for taking in oxygen?
A) Lungs B) Gills C) Stomate D) Atmosphere

Answer:D

Solution: Lungs, gills, and stomata are organs for gas exchange. Atmosphere is the source, not an organ.

3. The percentage of oxygen in the air does not change because?
A) oxygen is not used in any natural process
B) oxygen used up in natural processes is negligible
C) oxygen used up in some natural processes
D) oxygen used up in natural processes is replenished by the ozone layer

Answer:C

Solution: Oxygen used in respiration and combustion is replaced by photosynthesis

4. Which of these can plants not absorb directly from the atmosphere?
(FA & SA- 3 Marks / 4 Marks)
A) oxygen B) nitrogen C) carbon dioxide D) All the above

Answer:B

Solution: Plants absorb CO_2 and O_2 directly, but not nitrogen gas (needs nitrogen-fixing bacteria).

5. The percentage amount of which of these gases in air is the least?
A) oxygen B) carbon dioxide C) nitrogen D) water vapour

Answer:B

Solution: CO_2 is about 0.04%, less than O_2 (21%), N_2 (78%), water vapor (varies but can be higher locally).

6. The major component of air is
A) oxygen B) carbon dioxide C) nitrogen D) water vapour

Answer:C

Solution: Major component of air is Nitrogen ~78%.

7. The layer of air around the earth is known as
A) atmosphere B) air C) ozone layer D) troposphere

Answer:A

Solution:Layer of air around the Earth is called Atmosphere.

8. How does an earthworm breath? **(FA & SA- 5 Marks / 8 Marks)**
A) air B) soil C) water D) wind

Answer:B

Solution:Earthworms breathe through their moist skin (absorb oxygen from air through skin).

Soil (because they absorb oxygen through the moisture in soil)

9. The_____ is used to draw water from tubewalls and to run flourmills?
A) liquid B) solid C) air D) water

Answer:C

Solution:Wind (air in motion) used in windmills.

10. Birds,bats and insects can fly due to the prexnce of
A) air B) oxygen C) water D) CO₂

Answer:A

Solution:They fly because of air, which provides lift and resistance.

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Choice Type:

11. Air contains
A) Oxygen B) Carbon dioxide C) Nitrogen D) Water vapour

Answer:A,B,C,D

Solution:Air is a mixture of gases and some variable components.

It includes:

Oxygen (O₂)

Carbon dioxide (CO₂)

Nitrogen (N₂)

Water vapour (amount varies with place and weather)

12. The major components of air
A) Oxygen B) Dust C) Water vapour D) Nitrogen

Answer:A,D

Solution:Nitrogen (~78%)

Oxygen (~21%)

Water vapour and dust are minor components

Statement Type :

- A) Both statement I and II are correct and statement II is correct explanation of statement I.
B) Both statement I and II are correct and statement II is not correct explanation of statement I.

C) Statement I is correct and statement II is incorrect.

D) Statement I is incorrect and statement II is correct

13. **Statement I** : The percentage of oxygen in the air is 23%

Statement II : The percentage of nitrogen in the air is 78%

Answer:D

Solution:Statement I: The percentage of oxygen in the air is 23%

Actually, oxygen is about 20.95% (often rounded to 21%), not 23%.

So Statement I is incorrect.

Statement II: The percentage of nitrogen in the air is 78%

This is correct (about 78.08% nitrogen).

So Statement II is correct

Comprehension type:

We have learnt earlier that air contains water vapour. We also saw that, when air comes in contact with a cool surface, it condenses and drops of water appear on the cooled surfaces. The presence of water vapour in air is important for the water cycle in nature.

14. The presence of water vapour in air is important for

A) combustion B) water cycle C) air pollution D) respiration

Answer:B

Solution:The presence of water vapour in air is important for the water cycle in nature.

Integer Type :

15. The percentage of carbon dioxide in air_____

Answer:0.03% to 0.04%

Solution:

The percentage of carbon dioxide in air is quite small compared to oxygen and nitrogen.

In normal, clean air, carbon dioxide (CO₂) is about 0.03% to 0.04% by volume.

This value can increase slightly in polluted areas or indoors due to respiration and combustion

Matrix Matching Type :

16.

Column-I

Column-II

a) oxygen is required for

1) water vapour

b) carbon dioxide is used for

2) respiration

c) we feel suffocated due to

3) photosynthesis

d) water present in air

4) carbon dioxide.

Answer:a-2,b-3,c-4,d-1

Solution:

a) oxygen is required for

2) respiration

b) carbon dioxide is used for

3) photosynthesis

- c) we feel suffocated due to
d) water present in air

- 4) carbon dioxide
1) water vapour

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

1. Air is a
A) Compound B) Element C) Mixture D) Particle

Answer:C

Solution: Air is a mixture of gases.

2. The oxygen gas is than air
A) Lighter B) Heavier
C) Has the same weight D) None of these

Answer:B

Solution: Air's average molar mass ~29 g/mol; O₂ is 32 g/mol → Oxygen is heavier than air.

3. Mountaineers carry cylinders of which gas with them ?
A) Oxygen B) Nitrogen C) Hydrogen D) Carbon dioxide

Answer:A

Solution: Oxygen, because at high altitudes, oxygen level in air is low.

4. Moving air is known as
A) Wind B) Breeze C) Ozone D) Water vapour

Answer:A

Solution: Moving air is known as Wind.

5. Air is a conductor of heat
A) Good
B) Bad
C) Some times good, some times bad
D) None of the above

Answer:B

Solution: Air is a poor (bad) conductor of heat.

6. The moisture in air is called
A) Atmosphere B) Respiration C) Water vapour D) Humidity

Answer:D

Solution: The moisture in air is called Humidity (water vapour is the gas, humidity is the measure of it).

7. On heating water, it is observed that bubbles come from it this concludes that
A) Water contains air
B) Air contains water
C) Water contains dissolved minerals

D) All of the above

Answer:A

Solution: On heating water, bubbles come from it. This shows Dissolved air in water escapes on heating.

8. The density of air with height

A) Increases

B) Decreases

C) Remains the same

D) First increases, then decreases

Answer:B

Solution:Decreases (air gets thinner at higher altitude).

9. The composition of Nitrogen in air is

A) 78%

B) 99%

C) 88%

D) 90%

Answer:A

Solution:The composition of Nitrogen in air is 78%

10. Oxygen and carbon dioxide are replaced in nature by

A) Photosynthesis

B) Respiration

C) Both a and b

D) Evaporation

Answer:C

Solution:Oxygen and carbon dioxide are replaced in nature by Photosynthesis ($\text{CO}_2 \rightarrow \text{O}_2$) and respiration ($\text{O}_2 \rightarrow \text{CO}_2$).

JEE MAINS LEVEL QUESTIONS

1 Which of the following gases supports burning?

A) Nitrogen

B) Carbon dioxide

C) Oxygen

D) All of the above

Answer:C

Solution:Oxygen supports combustion.

2 Choose the incorrect statement from the following?

A) Air is a mixture of gases

B) The composition of oxygen in the air is the maximum

C) The envelope of air that surrounds the earth is the atmosphere

D) Aquatic plants and animals use dissolved oxygen in the air

Answer:B

Solution:A) Air is a mixture → True

B) Composition of oxygen in air is maximum → False (nitrogen is maximum)

C) Envelope of air is atmosphere → True

D) Aquatic life uses dissolved oxygen → True

3 Which of the following components of air is harmful to living beings?

(FA & SA- 2 Marks)

- A) Nitrogen B) Oxygen C) Dust D) Water vapour

Answer:C

Solution: Dust (pollutants) can be harmful.

- 4 The gas plants use for respiration is
A) Oxygen B) Carbon dioxide C) Nitrogen D) Dust

Answer:A

Solution: The gas plants use for respiration is Oxygen, as they take in oxygen from the air and use it to release energy from their food. While plants use carbon dioxide for photosynthesis, they also perform respiration to get energy, which requires oxygen just like animals.

- 5 What is air?
A) air is formed everywhere, we cannot see air, but we can feel it.
B) air in motion we called wind
C) known as atmosphere
D) All the above.

Answer:D

Solution: All given statements are correct.

- 6 The components of air used by given plants to make their food is
(FA & SA- 3 Marks / 4 Marks)
A) Ozone layer B) Carbon dioxide C) Hydrogen D) Argon

Answer:B

Solution: Component used by plants to make food Carbon dioxide (photosynthesis).

- 7 Air takes up
A) Water B) Weight C) Space D) CO₂

Answer:C

Solution: Air occupies space.

- 8 We can the air
A) feel B) Touch C) Smell D) Drink

Answer:A

Solution: We can feel air (wind), but not see/smell pure air.

- 9 Identify the gas " odourless, colourless, heavier than air, does not support combustion"?
(FA & SA- 5 Marks / 8 Marks)
A) Nitrogen B) Oxygen C) Carbon dioxide D) Water vapour

Answer:C

Solution: Carbon dioxide fits this description.

- 10 Cloths dry faster when there is water vapour in air
A) less B) more
C) either less (or) more D) none of these

Answer:A

Solution: Less humidity → faster evaporation.

JEE ADVANCED LEVEL QUESTIONS**Multi Correct answer type**

11. Which of the following are properties of air?

- A) air occupies space B) air is present everywhere
C) air exerts pressure D) air has mass

Answer:A,B,C,D

Solution:

A) Air occupies space → True

B) Air is present everywhere → True (on Earth, in the atmosphere)

C) Air exerts pressure → True

D) Air has mass → True

All are correct.

12. Which of the gases make up about 99% of the air?

- A) Nitrogen B) Oxygen C) CO₂ D) Water vapour

Answer:A,B

Solution:Dry air composition:

Nitrogen ~78%

Oxygen ~21%

Total ~99%

CO₂ ~0.04% (not part of the 99%)

Water vapor variable (not part of fixed 99%)

So A) Nitrogen and B) Oxygen together make up about 99%.

Statement Type :

A) Both statement I and II are correct and statement II is correct explanation of statement I.

B) Both statement I and II are correct and statement II is not correct explanation of statement I.

C) Statement I is correct and statement II is incorrect.

D) Statement I is incorrect and statement II is correct

13. **Statement I** : Hot air bollon rises up in the air

Statement II : Hot air is lighter than cold air

Answer:A

Solution:Statement I: Hot air balloon rises up in the air → True

Statement II: Hot air is lighter than cold air → True (less dense)

Statement II explains why hot air balloons rise (buoyancy).

14. **Statement I** : Air is a mixture of gases, water vapours and dust particles.
Statement II : Air is present every where including water and soil.

Answer:B

Solution:

Statement I: Air is a mixture of gases, water vapor, and dust particles → True

Statement II: Air is present everywhere including water and soil → True
 (air in soil pores, dissolved in water)

Statement II is correct but does not explain Statement I;
 they are separate facts.

Comprehension type :

The burning of fuel also produces smoke. Smoke contains a few gases and fine dust particles and is often harmful. That is why you see long chimneys in factories. This takes the harmful smoke and gases away from our noses, but, brings it closer to the birds flying up in the sky! Dust particles are al

15. What are the particles produces from chimneys in factories
 A) Dust particles B) Oxygen C) Carbon dioxide D) Nitrogen

Answer:A

Solution:Dust particles are part of the smoke from chimneys.

Integer Type :

16. The ratio of Nitrogen to Oxygen in the air is

Answer:26/7

Solution:Nitrogen ~ 78%

Oxygen ~ 21%

Ratio =Nitrogen/Oxygen=78/21=26/7

17. The Percentage of Argon in air

Answer:~ 0.93%

Solution:Argon is a noble gas present in air ~ 0.93%

Matrix Matching Type :

- | 18. Column-I | Column-II |
|------------------------------|----------------------------------|
| a) weather cock | 1) gases are fine dust particles |
| b) mountaineers | 2) sailing yacht |
| c) fine hair inside the nose | 3) oxygen cylinders |
| d) smoke | 4) direction of air flow |
| e) wind | 5) prevent dust particles. |

Answer:a-4, b-3, c-5, d-1, e-2

Solution:

- | | |
|------------------------------|----------------------------------|
| a) weather cock | 4) direction of air flow |
| b) mountaineers | 3) oxygen cylinders |
| c) fine hair inside the nose | 5) prevent dust particles. |
| d) smoke | 1) gases are fine dust particles |
| e) wind | 2) sailing yacht |

KEY

TEACHING TASK									
JEE MAINS LEVEL QUESTIONS									
1	2	3	4	5	6	7	8	9	10
D	D	C	B	B	C	A	B	C	A
JEE ADVANCED LEVEL QUESTIONS									
11	12	13	14	15	16				
A,B,C,D	A,D	D	B	0.03% to 0.04%	a-2,b-3,c-4,d-1				
LEARNERS TASK									
CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)									
1	2	3	4	5	6	7	8	9	10
C	B	A	A	B	D	A	B	A	C
JEE MAINS LEVEL QUESTIONS									
1	2	3	4	5	6	7	8	9	10
C	B	C	A	D	B	C	A	C	A
JEE ADVANCED LEVEL QUESTIONS									
11	12	13	14	15	16	17	18		
A,B,C,D	A,B	A	B	A	26-Jul	0.93%	a-4, b-3, c-5, d-1, e-2		