

CLASS 9 SCIENCE

CHAPTER 13 • EARTH AS A SYSTEM: ENERGY, MATTER, AND LIFE

MCQs • Multiple-Choice Practice

1. The main source of energy for most processes on Earth is the:

- A. Moon
- B. Sun
- C. Earth's core
- D. Oceans

2. Which Earth sphere includes solid rocks, soil, landforms and Earth's interior?

- A. Hydrosphere
- B. Geosphere
- C. Biosphere
- D. Atmosphere

3. The hydrosphere includes:

- A. Only glaciers
- B. Oceans, rivers, lakes and groundwater
- C. Only rocks
- D. All living organisms

4. The cryosphere refers to:

- A. All liquid water
- B. The solid form of water such as ice and snow
- C. The atmosphere
- D. Living organisms

5. The atmosphere is:

- A. The air surrounding Earth
- B. All water on Earth
- C. Earth's solid interior
- D. All living organisms

6. The biosphere includes:

- A. Only forests
- B. All living organisms and their habitats
- C. Only oceans
- D. Only soil

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7. A disturbance in one Earth sphere can:

- A. Never affect other spheres
- B. Lead to changes in other spheres
- C. Affect only rocks
- D. Stop all energy flow

9. The speed of electromagnetic waves in vacuum is approximately:

- A. 3×10^8 m/s
- B. 3×10^{10} m/s
- C. 3×10^2 m/s
- D. 9.8 m/s

11. The visible light from the Sun reaching Earth's surface provides energy for:

- A. Photosynthesis
- B. Earthquakes
- C. Tides only
- D. Volcanic eruptions

8. Solar radiation reaches Earth mainly as:

- A. Sound waves
- B. Electromagnetic waves
- C. Water waves
- D. Seismic waves

10. About 99% of the Sun's energy reaching Earth is concentrated mainly in the:

- A. Gamma, X-ray and radio regions
- B. UV, visible and infrared regions
- C. Microwave and radio regions only
- D. X-ray and gamma regions only

12. The fraction of solar radiation reflected by a surface is called:

- A. Insolation
- B. Albedo
- C. Humidity
- D. Pressure

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13. A surface with high albedo generally:

- A. Absorbs more solar radiation
- B. Reflects more solar radiation
- C. Always becomes hotter
- D. Produces more greenhouse gases

15. The amount of the Sun's radiation that reaches Earth's surface is called:

- A. Insolation
- B. Condensation
- C. Evaporation
- D. Convection

17. Greenhouse gases help keep Earth warm by:

- A. Blocking all sunlight
- B. Trapping a portion of outgoing heat
- C. Reflecting all visible light
- D. Stopping evaporation

14. Snow and ice generally have:

- A. High albedo
- B. Very low albedo
- C. Zero albedo
- D. No reflective property

16. The solar constant is approximately:

- A. 14 W m^{-2}
- B. 1.4 kW m^{-2}
- C. 140 kW m^{-2}
- D. 0.14 W m^{-2}

18. Which gas is identified in the chapter as a greenhouse gas?

- A. Carbon dioxide
- B. Helium only
- C. Neon only
- D. Hydrogen only

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19. The ozone layer is important because it:

- A. Absorbs harmful UV radiation
- B. Produces all oxygen
- C. Causes earthquakes
- D. Prevents all rainfall

20. The ozone layer is mainly located in the:

- A. Troposphere
- B. Stratosphere
- C. Exosphere
- D. Mesosphere only

21. Most weather phenomena such as rainfall occur in the:

- A. Troposphere
- B. Thermosphere
- C. Exosphere
- D. Mesosphere

22. Wind is the movement of air from a region of:

- A. Low pressure to high pressure
- B. High pressure to low pressure
- C. Equal pressure to equal pressure only
- D. No pressure to high pressure

23. Uneven heating of Earth's surface is mainly responsible for:

- A. Winds and ocean currents
- B. Only earthquakes
- C. Only volcanoes
- D. Only tides

24. During the day in a mountainous region, warm air rises over the heated slopes and cooler air moves up from the valley. This is called:

- A. Mountain breeze
- B. Valley breeze
- C. Sea breeze
- D. Polar wind

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25. After sunset, cooler and denser air flows down the mountain slopes into the valley. This is called:

- A. Valley breeze
- B. Mountain breeze
- C. Land breeze
- D. Equatorial wind

27. Water, carbon, nitrogen and oxygen continuously cycle between:

- A. Only the atmosphere
- B. Atmosphere, oceans, land and living organisms
- C. Only plants
- D. Only rocks

29. Atmospheric oxygen is used in:

- A. Respiration, combustion and oxide formation
- B. Photosynthesis only
- C. Evaporation only
- D. Condensation only

26. Planetary winds are produced by large-scale pressure differences caused mainly by:

- A. Uneven heating between equator and poles
- B. Moonlight
- C. Earth's oceans alone
- D. Earth's magnetic field

28. Biogeochemical cycles help to:

- A. Recycle essential nutrients and sustain life
- B. Stop nutrient movement
- C. Create new elements
- D. Remove all natural variation

30. The process that mainly restores atmospheric oxygen is:

- A. Respiration
- B. Photosynthesis
- C. Combustion
- D. Weathering

ANSWER KEY

Chapter 13 • Earth as a System: Energy, Matter, and Life

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	B	3	B	4	B	5	A
6	B	7	B	8	B	9	B	10	B
11	A	12	B	13	B	14	A	15	A
16	B	17	B	18	A	19	A	20	B
21	A	22	B	23	A	24	B	25	B
26	A	27	B	28	A	29	A	30	B

Quick Revision: Earth system • Geosphere • Hydrosphere • Cryosphere • Atmosphere • Biosphere • Solar radiation • Electromagnetic spectrum • Insolation • Albedo • Greenhouse effect • Ozone layer • Atmospheric layers • Winds • Valley & mountain breezes • Planetary winds • Water, carbon, nitrogen & oxygen cycles • Biogeochemical cycles