

IASbaba's Daily Prelims Test [Day 39]

TOPIC: Geography – Earth and the Universe, India Year Book, Current Affairs

1. Consider the statements regarding our Solar System.

- 1) Pluto is the largest dwarf planet revolving around the Sun.
- 2) Every planet except Venus rotates from West to East just like Earth on its own axis.
- 3) It is nuclear fusion which takes place within the Sun which releases huge heat energy.

Choose the correct statements from the following code.

- 1) 1, 2 only.
- 2) 1, 3 only.
- 3) 2, 3 only.
- 4) 3 only.

Answer: 4

Pluto is the second largest dwarf planet next only to Eris.

Venus and Uranus' rotatory motion is different from rest of the planets ie from East to West.

Hydrogen nuclei combine to form helium inside the Sun under high temperature and pressure and releases huge heat energy and this process is nuclear fusion.

2. Earth although has an average density of 5.5 g/cm^3 , its core has a density of more than 11 g/cm^3 .

What are the possible reasons?

- 1) Core is formed of materials like iron, nickel etc which has higher density.
- 2) Incumbent pressure from the overlying rocks.
- 3) High temperature prevalent in the core region [more than 5000 degree Celsius].

Choose the correct code from the following.

- 1) 1, 2 only.
- 2) 2, 3 only.
- 3) 1, 3 only.
- 4) All the above.

Answer: 1

High temperature need not result into higher density.

3. There are different discontinuities within the Earth's internal structure. Which are the discontinuities that have been incorrectly matched with its/their respective locations?

- 1) Mohorvic discontinuity -- boundary between Core and Mantle.
- 2) Wiechert-Gutenberg discontinuity -- boundary between Crust and Mantle.
- 3) Conrad discontinuity – located at a depth of 15-20kms from the Earth's surface.

Choose the correct code from the following.

- 1) 1, 2 only.
- 2) 2, 3 only.
- 3) 3 only.
- 4) 2 only.

Answer: 1

Mohorvic discontinuity is the boundary between Crust and Mantle.

Wiechert-Gutenberg discontinuity is the boundary between Core and Mantle.

4. Consider the statements regarding Earth's interior and seismic waves.

- 1) Primary waves totally disappear in the core region revealing that outer core is made up of liquid.
- 2) Secondary waves show changes in its speed as it travels from magma chamber to lithosphere region indicating difference in density.
- 3) The speed of secondary waves is highest inside the Earth's Core region indicating highest density in the Core region.

Choose the correct statement/s from the code below.

- 1) 1, 2 only.
- 2) 2 only.
- 3) 1, 3 only.
- 4) 2, 3 only.

Answer: 2

Primary waves (P-waves) are compressional waves that are longitudinal in nature. These waves can travel through any type of material, including fluids, and can travel at nearly twice the speed of S waves. Thus will not disappear in the core. But S waves do disappear in the core region.

Secondary waves (S-waves) are shear waves that are transverse in nature. S-waves can travel only through solids, as fluids (liquids and gases) do not support shear stresses. S-waves are slower than P-waves, and speeds are typically around 60% of that of P-waves in any given material. S waves speed varies with density just like P waves and this speed increases with increasing density. Since there is density difference between lithosphere and magma chamber the speed of the S waves do change.

S waves do not enter the Core region as the outer core is made up of liquid.

5. Earth experiences seasons in a rhythmic fashion.

What are the causative factors?

- 1) Rotation of the Earth on its own axis.
- 2) Revolution of the Earth in its orbit around the Sun.
- 3) Spherical shape of the Earth.
- 4) Earth's tilted axis.
- 5) Axial parallelism.

Choose the correct code from the following.

- 1) 1, 2 only.
- 2) 1, 2, 3 only.
- 3) 1, 2, 4, 5 only.
- 4) All the above.

Answer: 4

Axial parallelism is the unchanging orientation of the Earth's axis. Earth's North Pole is currently pointing to the Polar star.

All the above reasons combine and result a into season formation.

6. Winter solstice for Northern Hemisphere generally is on 22nd or 21st December every year.

Consider the statements regarding winter solstice in Northern Hemisphere.

- 1) The circle of illumination excludes the North Pole region from Sunlight.
- 2) From 66.5 degree South to 90 degree South, the Sun remains below the horizon the entire day.
- 3) Arctic Circle is the Southernmost parallel in the Northern Hemisphere that experiences a 24 hour period of darkness on this day.

Choose the correct statements from the codes below.

- 1) 1 only.
- 2) 1, 3 only.
- 3) 2 only.
- 4) None of the above.

Answer: 2

Winter solstice occurs for the Northern Hemisphere in December and for the Southern Hemisphere in June.

In the second statement it should have been 66.5 degree North to 90 degree North latitude and not South latitudes.

7. Paleomagnetism is the past magnetism of Earth stored in a rock.

Which among the following type of rocks provides most reliable readings of magnetism at a particular time?

- 1) Igneous rocks.
- 2) Sedimentary rocks.
- 3) Metamorphic rocks.
- 4) All the above rock types are equally reliable.

Answer: 1

Increasing reliability of the rocks: igneous > sedimentary > metamorphic.

8. Earth's magnetosphere is the area around the Earth where the geomagnetic field stretches out into space. Consider the following statements regarding magnetosphere.

- 1) It is uneven in shape as it stretches largely towards the Sun because of Sun's magnetic field.
- 2) Solar winds can have influence on the Earth's magnetosphere.
- 3) This sphere deflects the charged particles that approach the Earth's surface.

Choose the correct statement/s from the following codes.

- 1) 1, 2 only.
- 2) 2, 3 only.
- 3) 1, 3 only.
- 4) All the above.

Answer: 2

First statement is wrong because the magnetosphere stretches away from the Sun and not towards the Sun.

The solar wind is a stream of plasma released from the upper atmosphere of the Sun. It consists of mostly electrons, protons and alpha particles with energies usually between 1.5 and 10 keV.

As the solar wind approaches a planet that has a well-developed magnetic field (such as Earth, Jupiter and Saturn), the particles are deflected by the Lorentz force. This region, known as the magnetosphere, causes the particles to travel around the planet rather than bombarding the atmosphere or surface. The magnetosphere is roughly shaped like a hemisphere on the side facing the Sun, then is drawn out in a long wake on the opposite side. The boundary of this region is called the magnetopause, and some of the particles are able to penetrate the magnetosphere through this region by partial reconnection of the magnetic field lines.

9. Plasma is one of the four fundamental states of matter. Consider the following statements.

- 1) It doesn't have volume but has shape.
- 2) It is the most abundant form of matter.
- 3) Gas or air can be turned into plasma when artificially ionized.

Choose the correct statements from the codes below.

- 1) 3 only.
- 2) 1, 3 only.
- 3) 2, 3 only.
- 4) 1 only.

Answer: 3

It neither has volume nor has shape.

The matter in Sun and other stars in the universe is made up of plasma matter, hence most abundant.

Electromagnetic phenomenon can be used to ionize gas particles.

10. Sun spots are the one found on the outer surface of the Sun.

Consider the statements regarding Sun spots.

- 1) Sun spots region generally have lower temperature than the surrounding region on the Sun's outer surface.
- 2) Sun spots do not have any effect on Earth's climate.
- 3) Each period of weak Sun spot activity co-relates with the period of overall high solar radiation output from the Sun's surface.
- 4) Sun spots generally have 11 year cycle.

Choose the correct statement/s from the following codes.

- 1) 1, 2 only.
- 2) 1, 3, 4 only.
- 3) 1, 2, 4 only.
- 4) 2, 4 only.

Answer: 2

Sunspots are temporary phenomena on the photosphere of the Sun that appear visibly as dark spots compared to surrounding regions. They correspond to concentrations of magnetic field that inhibit convection and result in reduced surface temperature compared to the surrounding photosphere. Sunspots usually appear as pairs, with each spot having the opposite magnetic polarity of the other.

Sunspot populations quickly rise and more slowly fall on an irregular cycle of 11 years, although significant variations in the number of sunspots attending the 11-year period are known over longer spans of time.

Since sunspots are darker than the surrounding photosphere it might be expected that more sunspots would lead to less solar radiation and a decreased solar constant. However, the surrounding margins of sunspots are brighter than the average, and so are hotter; overall, more sunspots increase the Sun's solar constant or brightness.

Thus sun spots do have effect on the Earth's climate because it varies the solar radiation output thus affecting the insolation reaching on the Earth's surface.

11. Consider the following regarding PSLV and GSLV

1. PSLV are used to place remote sensing satellites to Sun-synchronous polar orbits only while GSLV can place satellites into Geosynchronous Transfer Orbit (GTO)
2. GSLV is more powerful and reliable launch vehicle than PSLV
3. GSLV has four stage cryogenic system while PSLV has three stage solid and liquid propulsion system

Identify the Correct Statement/s

1. 1, 2 and 3
2. 2 and 3
3. 1 and 2
4. None

Solution- 4

PSLV can also launch satellites into GTO. PSLV is more reliable than GSLV. GSLV has three stages while PSLV has four stages.

12. WiMAX and Wi-Fi are wireless technologies having similar features. Consider the following statements regarding them

1. WiMAX provides wireless broadband connectivity for short ranges while Wi-Fi provides for long ranges
2. Wi-Fi is more controlled and requires a licensed spectrum for official and Home networks, provided by service operator whereas WiMAX can be used in small offices and Home without licensed spectrum.
3. WiMAX provides more stronger frequency than Wi-Fi

Identify the WRONG statements

1. 1, 2 and 3
2. 2 and 3
3. 1 and 3
4. None

Solution- 1

1. "WiMAX" stands for "Worldwide Interoperability for Microwave Access"; "Wi-Fi" stands for "Wireless Fidelity."

2. WiMAX provides wireless broadband connectivity for long ranges; Wi-Fi provides short-range, wireless broadband connectivity mostly within an office or home.

3. WiMAX is more controlled and requires a licensed spectrum; the service is deployed by the service providers. Wi-Fi can work in a less controlled environment; it works in an unlicensed environment and is less controlled. Moreover, the end users have to buy the devices.

4. WiMAX uses MAC protocol which is connection oriented; Wi-Fi uses connection-based or connectionless protocol called CSMA/CA.

13. Consider the following statements about Green Diesel and Bio Diesel

1. They are second generation biofuels
2. Green diesel has different chemical properties as compared to petroleum-based diesel
3. Green Diesel is produced by Trans-esterification while Biofuels are produced by hydrogenating triglycerides

Identify the correct statement/s

1. 1, 2 and 3
2. 2 and 3
3. 1 and 3
4. None

Solution- 4

They are first generation biofuels. They have similar chemical properties. In third statement, Trans-esterification- Biofuels and Hydrogenation- Green Diesel

14. Recently Japanese Encephalitis (JE) has claimed many lives in Assam, India. Consider the following statements regarding this

1. It is a viral disease caused by a flavivirus.
2. JE is related to Yellow fever, West Nile viruses and Dengue
3. Birds and Pigs are host

Identify the WRONG statement/s

1. 1, 2 and 3
2. 2 and 3
3. 1 and 2
4. None

Solution- 4

All are correct.

<http://www.who.int/mediacentre/factsheets/fs386/en/>

15. National Youth Policy-2014 intends to empower youth. What are the policy interventions to be followed in this regard?

1. Promoting social values among youth
2. Engaging them in sports activities
3. Involving them in politics
4. Entrepreneurship skills
5. Giving equitable Health facilities

Select the correct codes

1. 1, 2, 4 and 5
2. 2, 3, 4 and 5
3. 1, 2 and 5
4. 1, 2, 3, 4 and 5

Solution- 4

The Policy seeks to recommend specific future policy interventions required in each of the 11 priority areas.

Create a productive work force

1. Education
2. Entrepreneurship
3. Employment and Skill Development

Develop a strong and healthy generation

4. Health and Healthy Lifestyle
5. Sports

Instill social values and promote community service

6. Promotion of Social Values 7. Community Engagement

Facilitate participation and civic engagement

8. Participation in Politics and Governance 9. Youth Engagement

Support youth at risk and create equitable opportunity for all

10. Inclusion 11. Social Justice

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