



### Daily Current Affairs Prelims Quiz 13-05-2022 - (Online Prelims Test)

1) Consider the following statements:

1. The photon is a particle of spin equal to one unit that mediates the electromagnetic interaction or force.
2. Gauge bosons mediate other interactions such as strong interactions, weak interactions, etc.
3. If an object or particle enters the event horizon surrounding a black hole, it cannot escape the gravitational pull of the black hole.

Which of the above statement(s) is/are correct?

- a. 1 and 3 only
- b. 3 only
- c. 1 and 2 only
- d. 1, 2 and 3

Answer : d

### Fundamental Forces

- The four fundamental forces of nature such as electromagnetic, gravitational, strong nuclear forces, and weak nuclear forces.
- The photon is a particle of spin equal to one unit that mediates the electromagnetic interaction or force.
- Gauge bosons act as intermediaries and mediate other interactions such as strong interactions, weak interactions, etc.
- The event horizon represents the distance of approach beyond which even light cannot escape.
- If an object or particle enters the event horizon surrounding a black hole, it cannot ever escape the gravitational pull of the black hole.

2) Consider the following statements regarding twin cyclones:

1. Twin tropical cyclones are caused by equatorial Rossby waves, which are huge waves with wavelengths around 4,000-5,000 Kms.
2. Twin cyclones always move into different hemispheres, the northern hemisphere cyclone will move north and east, while the southern one will move south and west.

Which of the above statement(s) is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : a

Cyclone Asani, active now in the Bay of Bengal, has a twin — cyclone Karim — in the southern hemisphere.

## **Twin Cyclones**

- The interplay of the wind and the monsoon system combined with the Earth system produces these synchronous cyclones.
- Twin tropical cyclones are caused by what are called equatorial Rossby waves.
- Rossby waves are huge waves in the ocean with wavelengths of around 4,000-5,000 kilometers.
- This system has a vortex in the northern hemisphere and another in the southern hemisphere, and each of these is a mirror image of the other.
- The vortex in the north spins counterclockwise and has a positive spin.
- While the one in the southern hemisphere spins in the clockwise direction and therefore has a negative spin.
- Both have a positive value of the vorticity which is a measure of the rotation.

## **Will the two cyclones of the pair necessarily move into different hemispheres?**

- Once these cyclones form, generally, they will go westward.
- In the northern hemisphere, they will have a slightly northward component of motion.
- Whereas, in the southern hemisphere, they will usually have a slightly southward component to their movement.
- So this means the northern hemisphere cyclone would go North and West, while the southern one would go South and West.

3) Consider the following statements:

1. The gravitational force tugging between two bodies depends on how massive each one is and how far apart the two lie.
2. Space and time are interwoven, and events that occur at the same time for one observer could occur at different times for another.

Which of the above statement(s) is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : c

Astronomers reveal the first image of the black hole at the heart of the Milky Way galaxy.

## **Theory of relativity**

### **Newton**

- Gravity is the force of attraction that two objects exert on one another.
- Newton quantified gravity and formulated the three laws of motion.
- The gravitational force tugging between two bodies depends on how massive each one is and how far apart the two lie, according to NASA.
- Even as the center of the Earth is pulling you toward it (keeping you firmly lodged on the ground), your center of mass is pulling back at the Earth.

- But the more massive body barely feels the tug from you, while with your much smaller mass you find yourself firmly rooted thanks to that same force.
- Yet Newton's laws assume that gravity is an innate force of an object that can act over a distance.

## Einstein

- Albert Einstein, in his theory of special relativity, determined that the laws of physics are the same for all non-accelerating observers, and he showed that the speed of light within a vacuum is the same no matter the speed at which an observer travels, according to Wired.
- Einstein found that space and time were interwoven into a single continuum known as space-time.
- And events that occur at the same time for one observer could occur at different times for another.
- Einstein realized that massive objects caused a distortion in space-time.
- Light bends around a massive object, such as a black hole, causing it to act as a lens for the things that lie behind it.

4) Consider the following statements:

1. It is the world's smallest marine mammal.
2. It has been classified as critically endangered by the IUCN.
3. They are now found only in the Gulf of California, Mexico.

Identify the species.

- a. Vaquita
- b. Sea otter
- c. Weasel
- d. Tarsier

Answer : a

## Vaquita

- The vaquita porpoise is the world's smallest marine mammal and is believed to be on the brink of extinction, with 10 or fewer still living in Mexico's Gulf of California, their sole habitat.
- This little porpoise wasn't discovered until 1958 and a little over half a century later, we are on the brink of losing them forever.
- Vaquita is often caught and drowned in gillnets used by illegal fishing operations in marine protected areas within Mexico's Gulf of California.
- The population has dropped drastically in the last few years.
- Characteristics
- The vaquita has a large dark ring around its eyes and dark patches on its lips that form a thin line from the mouth to the pectoral fins.

5) Consider the following statements regarding Protected Mobility Vehicles (PMV):

1. It has ballistic protection and is unaffected by grenade and mine blasts, used in high-altitude and desert areas.
2. It is manufactured by DRDO in collaboration with the Israel defense ministry.

Which of the above statement(s) is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2

d. Neither 1 nor 2

Answer : a

### **Protected Mobility Vehicles (PMV)**

- The PMV is essentially a wheeled armored personnel carrier.
- It provides protection to the soldiers traveling inside the vehicle from mine blasts and sudden attacks by small arms.
- The troops in these vehicles could be members of any quick reaction team heading to a point of conflict, or members of patrolling parties heading to border areas.
- These vehicles are wheeled, in 4X4 drive mode, and should have automatic transmission.
- These vehicles have the capacity to carry ten personnel excluding the driver and co-driver with each person carrying a combat load of not less than 30 kg.
- They have ballistic protection and should be able to protect the vehicle from grenade and mine blasts.
- It has a maximum speed of 90km on road and 40km per hour on cross-country terrain.
- They also operate in the temperature range of 40 degrees centigrade to minus 15 degrees in high-altitude areas.



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