Overview of Elastic Collision

This is an encounter of the two bodies where the kinetic energy between the bodies remains unchanged. What we can observe is that there is no net conversion of the kinetic energy into any other forms.

An elastic collision is an encounter between two bodies in which the total kinetic energy of the two bodies remains the same. In an ideal, perfectly elastic collision, there is no net conversion of kinetic energy into other forms such as heat, noise, or potential energy.

During the collision of small objects it is observed that kinetic energy is first converted to potential energy associated with a repulsive or attractive force between the particles then this potential energy is converted back to kinetic energy (when the particles move with this force, i.e. the angle between the force and the relative velocity is acute). Collisions of atoms are elastic, for example, Rutherford backscattering. A useful special case of elastic collision is when the two bodies have equal mass, in which case they will simply exchange their momenta.

The molecules from atoms of a gas or liquid rarely experience perfectly elastic collisions because kinetic energy is exchanged between the molecules' translational motion and their internal degrees of freedom with each collision. At some instant , half the collisions are, to a varying extent, inelastic collisions.

The molecular collisions can be regarded as essentially elastic as long as Planck's law forbids energy from being carried away by black-body photons. In the case of macroscopic bodies, perfectly elastic collisions are an ideal never fully realized, but approximated by the interactions of objects such as billiard balls.

Collision, in simple terms, is when one moving object strikes a stationary body placed in its trajectory. Also, this term applies when two moving objects collide into one another, causing an instance of impact.

However, if you are wondering what elastic collision is, you have to understand a bit more than simple collision and impact. Elastic collision is an event of a collision between one moving and a stationary body or two objects in motion where the total kinetic energy and momentum remain unaltered.

Definition: An elastic collision is that collision where there is no net loss in kinetic energy in the system as a result of the collision. Both momentum and kinetic energy are conserved quantities inelastic collisions.

For example if two similar trolleys are traveling toward each other with equal speed then it is observed that they collide, bouncing off each other with no loss in speed. This collision is perfectly elastic because no energy has been lost.

A stationary object possesses potential energy, whereas a moving one converts potential energy into kinetic energy when in motion. Besides, momentum refers to motion in a moving body, which you get from the product of mass and velocity.

Moreover, the elastic collision definition states that the overall kinetic energy and the momentum are preserved in case of this category of collision. The concept itself assumes that the colliding objects preserve energy, which hardly happens in real-life events.

Therefore, elastic collision in physics refers to a standardized and hypothetical situation where the colliding bodies conserve their kinetic energies even after the event of a collision.

What are the Examples of Elastic Collision?

Now that you know what elastic collision is, you must move on to a few examples of this phenomenon. It will help you understand the real-life implications of elastic collision and enable you to relate to the events that happen around us.

Therefore, Elastic Collision Examples are as Follows –

a. If you drop a ball on the floor, it bounces back towards you instantly. In this event, the ball in motion preserves its overall momentum and kinetic energy, which is why it bounces back.

b. When two atomic particles collide into each other, they undergo an elastic collision. In case there is no loss of energy after contact, you can call it a perfectly elastic collision.

These instances will certainly help you comprehend and define elastic collision even better.

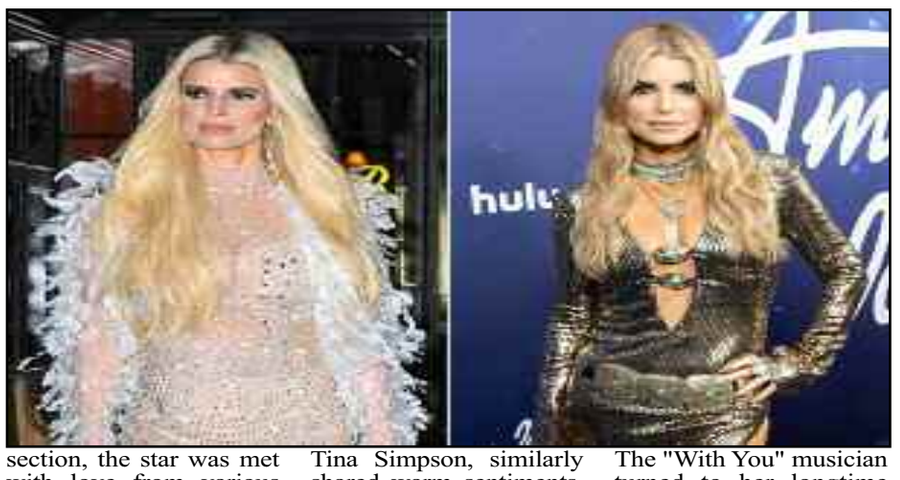
What is Inelastic Collision?

As you have already understood the instances and types of elastic collisions, you must also understand what its counterpart or inelastic collision stands for.

An inelastic collision is a category of collision among two moving objects, and these objects lose kinetic energy and momentum after contact. For instance, say that you drop a mound of clay on the ground or you witness a car crash. The mound of clay will not bounce back to you, or the car will not continue in its previous trajectory.

It happens because neither of these objects will be able to preserve its initial kinetic energy and momentum after striking another surface.

Jessica Simpson flaunts new hair transformation as she celebrates 45th birthday



Hollywood actress-singer Jessica Simpson, has once again undergone hair transformation. She moved on from her blond coloured hair, and showed off a darker hair transformation in an Instagram post, as she continued to mark celebrations for her 45th birthday.

The actress believes a change will do her good, reports 'People' magazine.

In the selection of images, Simpson's darker hair was front and center, as she posed for solo shots and group photos with loved ones while wearing a sparkling see-through dress.

As per 'People', the mother of three accessorised her sexy look with a long, black coat, statement jewelry, large silver heels and a black handbag.

Simpson marked her birthday in the caption of her latest Instagram post, writing, "Fancy dive into 45". In the comments section, the star was met with love from various famous friends, including JoJo, who wrote, "You look. Unbelievable ! Happy birthday gorgeous woman," while Carmen Electra commented, "happybirthday hottie".

Simpson's family members also shared some birthday love. Sister Ashlee Simpson wrote, "45. Ever looked better angel queen. Love you so much! This is your year (sic)". The girls' mom, Tina Simpson, similarly shared warm sentiments, adding in her own comment, "Happy Birthday my sweet girl! 45 looks real good on you! So thankful to be your Mommy. I love you".

The actress-singer previously showed off a similar hair change when she rocked freshly dyed dirty blonde tresses with sunkissed highlights for a special appearance on the season 23 finale of American Idol in May.

The "With You" musician turned to her longtime pro and friend Rita Hazan, a celebrity hair colorist and salon owner, for the color switchup.

Hazan said that the look was "more natural", comparing it to "a kid on the beach". She added at the time that the updated hairdo was perfect for Simpson, who was continuing to adjust to her new normal following her split from Eric Johnson earlier this year.

Niharica Raizada on being accepted 5in the industry: 'I'm working on it'

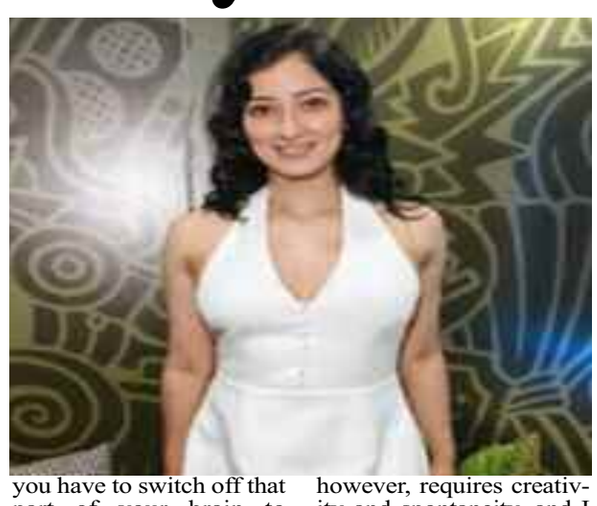
Actor, write and producer Niharica Raizada revealed that she has not yet entirely been accepted in the industry.

During an exclusive conversation with IANS, she was asked if she feels accepted by the industry yet, to which, she said she is still working towards it.

Speaking to IANS, Niharica revealed, "I have still not been accepted but I am trying to make myself be accepted. I come from a medical fraternity. There are a few girls who come from the medical fraternity- one being Sai Pallavi, the other being Manushi Chhillar, there are a few more dentists, doctors, and scientists in our film industry- we are slowly getting our place."

Asked, "Coming from a science background, did you have to switch off that part of your brain to become an actor, or do you still apply a scientific mindset?"

To this, she replied, "Oh, I absolutely apply a scientific approach—especially in production. Acting, however, requires creativity and spontaneity, and I allow myself to get lost in the madness of it. But yes, when it comes to managing a production house, I think the scientific method helps keep things structured."



Niharica recently worked on her album "Ishqbaazi" - a heartfelt tribute to her grandfather, legendary composer O.P. Nayyar.

Talking about it, she said, "This is my first production, and Ishqbaazi will always be incredibly special to me. I released it around my birthday, and it also coincided with a very meaningful occasion—what would have been the 100th birth anniversary of O.P. Nayyar ji. So yes, it's close to my heart. Establishing Raizada Entertainment as my production house and releasing Ishqbaazi under it is a memorable milestone. Your first work always holds a unique place."

She also marked her debut as a producer with "Ishqbaazi" under her home banner Niharica's production house.

First Female I.P.S. Officer in India

India has many people who have broken through obstacles and done amazing things in their life. One group of these people are those who were the first to do something. One of these firsts is first woman to become an I.P.S. Officer namely Kiran Bedi. In this article you will get to know about her life and her journey to become an I.P.S. Officer.

In a nation where traditional gender roles has long confined women to domestic spheres, the emergence of Kiran Bedi as the first female I.P.S. Officer is a big change in the history of India. She joined the police force as I.P.S. Officer which was a leading step for women's rights.

Birth date: 9th June, 1949

Birth place: Amritsar, Punjab, India

Kiran Bedi tryst with the Indian Police Service began in 1972 when she cleared the Civil Services Examination, achieving an extraordinary feat for women at that time. Her induction into the IPS was a historic moment that challenged societal norms and traditional notions about women's capabilities.

Throughout her illustrious career, Kiran Bedi made significant contributions to law, enforcement, prison reforms and social advocacy. Some of her notable achievements include:

• **Traffic Management:** As a young officer, Kiran Bedi brought innovative approaches to traffic management in Delhi. She introduced concepts like the 'Traffic Circle' to ease congestion and improve the flow of vehicles

• **Prison Reforms:** Serving as the Inspector General of Prisons in Tihar Jail, Bedi implemented a range of groundbreaking reforms, focusing on education, vocational training and rehabilitation for inmates.

• **Women's Empowerment:** Kiran Bedi has been an ardent advocate for women's empowerment and gender equality.

• **United Nations Peacekeeping:** Kiran Bedi also served as the Police Advisor to the Secretary-General in the United Nations, contributing her expertise to peacekeeping missions around the world.

• Kiran Bedi's journey has left an indelible mark on India's history. She never stopped trying her best, always did the right thing and worked hard to help people. She showed that girls can do great things and make a big difference, even in tough situations.

Question & Answer Series

Indian Constitution

I. Our National Anthem is -
1) Vande Mataram
2) Sare Jaha Se Achchha
3) Jhanda Uncha Rahe Hamara
4) Jana Gana Mana
View Answer

II. The reorganization of States on a linguistic basis was done in -
1) 1952 2) 1951
3) 1956 4) 1950

III. Arrange the name of the presidents in the order they served.
1) N. S Reddy, Giani Zail Singh, R. Venkataraman , Dr. Shankar Dayal Sharma
2) N.S. Reddy, R. Venkataraman , Giani Zail Singh, Dr. Shankar Dayal Sharma
3) N.S. Reddy, Dr. Shankar Dayal Sharma, R Venkataraman, Giani Zail Singh
4) R. Venkataraman, Dr. Shankar Dayal Sharma, Giani Zail Singh, N.S. Reddy

IV. Bodo and Dogri were added to the 8th Schedule by the following Amendment -
1) 81st Amendment
2) 92nd Amendment
3) 85th Amendment
4) 91st Amendment

V. In Part-IVA of the Constitution of India, which one of the following is not mentioned as a duty of every citizen of India?
1) To render national service when called upon to do so
2) To renounce practices derogatory to the dignity of women
3) To value and preserve a unitary national culture
4) To develop the spirit of inquiry and reform

VI. Which one of the following statements with regard to the Election Commission is not correct?
1) It conducts elections to the office of the Vice-President of India
2) An Election Commissioner can be removed from his office without the recommendation of the Chief Election Commissioner
3) Election Commissioners are

appointed by the President of India
4) The Governor of a State is constitutionally bound to provide support staff to the Election Commission if required

VII. Which one of the following is not a characteristic feature of Indian Federalism?
1) The federating units consented to form a union
2) Residuary powers vest with the Centre
3) Single citizenship
4) An extensive Union and Concurrent list

VIII. Which one of the following is not a provision related to a Money Bill?
1) Imposition, abolition, remission, alteration or regulation of any tax
2) Appropriation of money out of the Consolidated Fund of India
3) Imposition of fines by the local authority for local purpose
4) Custody of the Consolidated Fund of India or the Contingency Fund of India

IX. Which one of the following is not mentioned as a form of Emergency in the Constitution of India?
1) National Emergency
2) State Emergency in terms of Proclamation of President's Rule in a State
3) Financial Emergency
4) Health Emergency

X. Which one of the following statements with regard to the National Rural Employment Guarantee Act, 2005 is correct?
1) It ensures 175 days of employment for needy persons in rural areas
2) It gives higher wages to women workers
3) People are generally given both skilled and unskilled jobs
4) This is implemented only in rural areas of India

XI. The Government of National Capital Territory of Delhi (Amendment) Bill 2021, which was passed in March 2021 amended the Government of National Capital Territory of Delhi Act -
1) 1998 2) 1994
3) 1996 4) 1991

XII. Who among the following Presidents of India gave assent to the 100th Amendment of the Constitution of India?
1) Pranab Mukherjee
2) Ram Nath Kovind
3) APJ Abdul Kalam
4) Pratibha Devisingh Patil

XIII. Which of the following Amendments of the Constitution of India declared that the Parliament has the power to abridge or take away any of the Fundamental Rights under Article 368 and such an Act, will not be a law under the meaning of Article 13?
1) Twenty-third Amendment
2) Twentieth Amendment
3) Twenty-fourth Amendment
4) Twenty-eight Amendment

XIV. Which one of the following methods is followed in electing the President of India?
1) Proportional Representation only
2) First-Past-the-Post System only
3) Proportional Representation and the Single Transferable Vote System
4) Proportional Representation and the First-Past-the-Post System

Answer
I. 4, II. 3, III. 1, IV. 2, V. 3, VI. 2, VII. 1, VIII. 3, IX. 4, X. 4, XI. 4, XII. 1, XIII. 3, XIV. 3.

Reasoning Ability

I. Radha wears five different coloured clothes, red, green, yellow, purple and brown, on five different days of a week, from Monday to Friday. She wears red clothes on Wednesday. She does not wear green and brown clothes on Monday or Friday. She wears green clothes on the next day of wearing yellow clothes. On which day does she wear brown clothes?
1) Monday 2) Tuesday
3) Friday 4) Thursday

II. Introducing Kaumudi to a guest, a boy, Mihir, said, ''She is the only daughter of my mother's brother-in-law''. How is Mihir related to Kaumudi?
1) Brother 2) Father
3) Uncle 4) Cousin
ANS: 3

III. Which two numbers (Not Digits) need to be interchanged to make the following equation correct?
15 + 90 ÷ 9 x 5 - 11 = 28
1) 11 and 9 2) 15 and 9
3) 15 and 5 4) 9 and 5

IV. In a certain code language, 'TOMATO' is coded as 40-30-26-2-40-30 and 'GINGER' is coded as 14-18-28-14-10-36. How will 'GARLIC' be coded in that language?
1) 14-2-36-24-18-6
2) 7-2-18-24-18-3
3) 7-1-36-12-9-6
4) 14-1-18-24-18-3

V. Select the option that is related to the third term in the same way as the second term is related to the first term -
DOGMATIC : EQHOBVJD : : PRODUCTS : ?
1) RTQEWDVU
2) RTSEWDSQ
3) RTQFXDVU
4) RTQEWDWV

VI. Select the letter cluster that can replace the question mark (?) in the following series -
GHB, LMG, PQK, ?
1) STN 2) TSM

3) PQE 4) ABX

VII. If GATE is coded as QKDO, then PLAN will be coded as -
1) VFXK 2) FVKX
3) ZVXK 4) ZVKX
ANS: 4

VIII. Select the option that is related to the third number in the same way as the second number is related to the first number -
28 : 729 : 32 : ?
1) 961 2) 973
3) 824 4) 738

IX. Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the letter-cluster that is different.
1) WTR 2) WUT
3) MJH 4) SPN

X. Select the number from among the given option that can replace the question mark (?) in the following series -
39, 53, 69, 87, ?
1) 99 2) 107
3) 92 4) 115

XI. Select the correct combination of mathematical signs that can sequentially replace the * signs and balance the given equation.
15 * 1411 * 83 * 137 * 218 * 100
1) x, ÷, =, +, −
2) x, =, −, ÷, +
3) +, −, x, =, ÷
4) x, +, ÷, −, =

XII. In a certain code language, 3224 means Taj is in Agra , and 4245 means Agra is near Delhi. Which of the following is the code for I like all fruits?
1) 2534 2) 2425
3) 1526 4) 1436

XIII. If 'SYSTEM' is written as 'SYSMET' and 'NEARER' is written as 'AENRER', then 'FRACTION' will be coded as -
1) CARFNOIT
2) CARFTION
3) NOITFRAC
4) FRACNOIT

XIV. In a certain code 'PRAMOD' is written as 'SODJRA'. How is 'KESHAV' written in code ?
1) NBUEDS 2) TNBVECS
3) NBVFDS 4) NBVEDS

XV. In a certain 'SCRIPT' is written as 'TCQIQT'. How is 'DIGEST' written in that code?
1) EIHETT 2) TIHETT
3) EIFETT 4) TIFETT

XVI. In a certain code 'QUESTION' is written as 'NXBVQLLQ'. How is 'REPLY' written in that code?
1) OBMIV 2) UHSOB
3) OHMOV 4) OFMMV

XVII. In a certain code 'CLOCK' is written 'KCOLC'. How is 'STEPS' written in that code?
1) SPEST 2) SPSET
3) SEPST 4) SPETS

XVIII. 'If 'ORAL' is coded as '3196', then 'WRITTEN' is coded as -
1) 5 9 9 2 2 5 5
2) 5 5 2 2 9 9 5
3) 5 8 9 3 3 5 5
4) 5 1 9 2 2 5 6

XIX. If 'OPTION' is coded as 'UKXFQM' then 'CHOICE' is coded as -
1) HLRKDF 2) ICKFED
3) WMKLAF 4) ICSFED

Answer
I. 4, II. 3, III. 2, IV. 1, V. 1, VI. 1, VII. 4, VIII. 1, IX. 2, X. 2, XI. 3, XII. 4, XIII. 1, XIV. 4, XV. 3, XVI. 3, XVII. 4, XVIII. 2, XIX. 4.

Chemistry

I. Dichloro - dipenyl - trichloro - ethane (DDT) is a -
1) Biochemical pollutant
2) Non-biodegradable pollutant
3) Biodegradable pollutant
4) Non-pollutant
ANS: 2

II. Rusting of Iron is an example of -
1) Decomposition
2) Radioactive decay
3) Oxidation
4) Reduction
ANS: 3

III. Which of the following is an ore of iron?
1) Hematite
2) Alluminium
3) Bauxite
4) Cinnabar
ANS: 1

IV. Pure gold is -
1) 14 karat 2) 24 karat
3) 18 karat 4) 22 karat
ANS: 2

V. The most hazardous metal pollutant of automobile exhaust is -
1) Mercury 2) Lead
3) Tin 4) Copper
ANS: 2

VI. Benzene is -
1) Gaseous pollutant
2) Liquid pollutant
3) Solid pollutant
4) All of the above
ANS: 2

VII. Which acid is used for cleaning gold ornaments?
1) Nitric Acid
2) Boric Acid
3) Sulphuric Acid
4) Oxalic Acid
ANS: 1

VIII. Which of the following groups of organic compounds are least likely to be used in making perfumes?
1) Alcohols
2) Carboxylic Acids
3) Esters
4) Aldehydes
ANS: 2

IX. Which of the following gases are the main contributors to acid rain?
1) Oxygen and carbon monoxide
2) Sulphur dioxide and oxygen
3) Sulphur dioxide and hydrogen sulphide
4) Sulphur dioxide and nitrous oxide
ANS: 4

X. Which of the following properties is different for neutral atoms of two isotopes of the same element?
1) Atomic number
2) Mass
3) Number of electrons
4) General chemical reaction
ANS: 2

XI. Which of the following would be expected to form ionic solutions in water?
1) CO2 2) CCl4
3) O2 4) NaI
ANS: 4

XII. Gypsum is used in the case of the soils which are -
1) Soline 2) Alkaline
3) Waterlogged 4) Glavey
ANS: 2

XIII. As the temperature of water falls from 8°C to 1°C, water will -
1) First contract and then expand
2) First expand and then contract
3) Freeze
4) Gradually becomes denser
ANS: 1

XIV. Nitrogen in the air -
1) Is essential for the body
2) Dilutes oxygen which is very active in pure form
3) Makes oxygen soluble in the blood
4) Decreases the density of air
ANS: 2

XV. Iron is protected from rusting by coating with zinc. This process is called -
1) Galvanization
2) Condensation
3) Evaporation
4) None of the above
ANS: 1

XVI. Which of the following is not a fossil fuel?
1) Natural gas 2) Coal
3) Petroleum 4) Wood
ANS: 1

XVII. Which allotrope of carbon is in the form of a rigid three dimensional structure?
1) Graphite
2) Fullerene
3) Diamond
4) Lampblack

Answer
I. 2, II. 3, III. 1, IV. 2, V. 2, VI. 2, VII. 1, VIII. 2, IX. 4, X. 2, XI. 4, XII. 2, XIII. 1, XIV. 2, XV. 1, XVI. 1, XVII. 3.