

CLICK HERE TO JOIN OUR TELEGRAM CHANNEL

CONTENT

Section-1 : Physics

■ Physics.....	11-254
■ Unit/ Measurement/Measuring Instrument	11
● Unit	11
● Measurement	17
● Measuring Instrument.....	18
● Physical Quantities	22
■ Mechanics	23
● Work	23
● Power.....	30
● Energy	32
● Mass.....	45
● Newton's Law of Motion	47
● Force	52
● Linear Momentum	56
● Principle of Conservation of Momentum	59
● Distance and Displacement.....	61
● Speed/Velocity	61
● Projectile Motion	63
● Acceleration.....	63
● Equation of Linear Motion	66
● Friction	69
● Simple Harmonic Motion/ Rotational Motion.....	70
■ Gravitation	72
● Newton's Law of Gravitation.....	72
● Gravity and Motion under Gravity	77
● Satellite Motion /Escape Velocity	87
■ Properties of Matter.....	88
● Elasticity	88
● Surface Tension/Capillarity	88
● Flow of Liquids	88
● Buoyancy and Archimedes Principle.....	89

CLICK HERE TO JOIN OUR TELEGRAM CHANNEL

● Pressure.....	91
● Density.....	92
● Kinetic Theory.....	93
▣ Heat.....	94
● Temperature & Measurement of Temperature	94
● Thermal Conduction.....	96
● Thermal Expansion.....	97
● Convection.....	97
● Conductor/Non-conductor/Insulator	97
● Kirchhoff's Law/Stefan's Law/Newton's Law of Cooling.....	98
● Phase Transition and Latent Heat.....	99
● Relative Humidity/Vaporization.....	99
● Thermodynamics	100
▣ Wave.....	102
▣ Sound.....	107
● Nature of Sound Waves	107
● Frequency Range of Sound Waves.....	109
● Speed of Sound	110
● Characteristics of Sound	115
● Echo.....	116
● Sonar/Radar	117
▣ Light	118
● Nature of Light	118
● Scattering of Light	120
● Reflection of Light.....	125
◆ Rules of Reflection.....	125
◆ Reflection from Plane Mirror.....	139
◆ Reflection from Spherical Mirror	139
● Magnification	144
● Refraction of Light	147
● Total Internal Reflection of Light.....	155
● Lens (Convex/Concave)	155
● Human Eye	162
● Optical Instruments.....	164
● Dispersion of Light/Rainbow	164
▣ Electricity.....	167
● Electric Charge	167
● Coulomb's Law	171
● Electric Circuit.....	172

CLICK HERE TO JOIN OUR TELEGRAM CHANNEL

●	Electric Current	177
●	Electrical Conductivity/ Ohm's Law.....	183
●	Resistance	189
●	Electric Power/Energy	204
●	Electrical Instruments	215
●	Transformer	221
●	Electric Bulb	221
●	Electric Cell	223
▣	Magnetism.....	223
▣	Electronics.....	238
▣	Modern Physics	240
▣	Nuclear Physics.....	241
▣	Invention	246
▣	Miscellaneous.....	249

Section-2 : Chemistry

■	Chemistry	255-474
▣	Chemistry : An Introduction.....	255
●	Matters.....	255
●	Classification of Matters.....	256
●	Physical and Chemical Changes	257
●	Law of Conservation of Mass.....	259
●	Law of Constant Proportions.....	259
●	Dalton's Atomic Theory.....	260
●	Molecule/Atomic Weight	261
●	Mole Concept/Avogadro Number	264
●	Berzelius Hypothesis	269
●	Metals, Non-metals & Metalloids.....	269
●	Important methods of Separation of Mixture.....	273
●	Change in State of Matter	275
●	Solution.....	275
●	Allotropy.....	278
●	Amu Unit	280
▣	Atomic Structure	281
●	Atom and their Fundamental Components	281
●	Atomic Models	283
●	Quantum Numbers.....	283
●	Electronic Configuration	285
●	Heisenberg's Uncertainty Principle.....	289

CLICK HERE TO JOIN OUR TELEGRAM CHANNEL

■ Atomic Nucleus.....	289
● Atomic Number and Mass Number.....	289
● Isotopes.....	292
● Isobars	294
● Isoelectronics.....	294
■ Gaseous Law.....	294
■ Radioactivity and Nuclear Energy.....	296
■ Valency/Chemical Bonding	298
■ Oxidation and Reduction.....	304
■ Electrolysis & Electro Chemical Series	308
■ Acid, Base and Salt.....	312
● Acid	312
● Base	315
● Salt.....	317
● pH Value.....	318
● Acid-Base Indicator.....	321
● Amphoteric Oxide	323
■ Periodic Classification of Elements.....	324
● Newland's Law of Octaves	324
● Dobereiner's Law of Triads	329
● Mendeleev's Periodic Table.....	332
● Moseley's Modern Periodic Table	337
● Periodic Properties of Elements.....	355
■ Non-metals & Non-metallic Compounds and their Applications.....	363
● Hydrogen	363
● Oxygen	364
● Nitrogen.....	365
● Phosphorous	366
● Halogen.....	367
● Inert Gases	370
● Sulphur	373
● Carbon	374
■ Metals/ Metallic Compounds and their Applications.....	378
● Sodium.....	378
● Calcium.....	385
● Aluminium.....	393
● Silver	394
● Gold.....	396
● Potassium.....	396

CLICK HERE TO JOIN OUR TELEGRAM CHANNEL

289. When a bullet is fired from a gun, its potential energy is converted into?

- (a) Kinetic energy
- (b) Mechanical energy
- (c) Heat energy
- (d) Chemical energy

RRB ALP. & Tec. 29-08-2018(Shift-III)

Ans : (a) A bullet stores chemical potential energy in its gunpowder. When the bullet is fired, this chemical potential energy is converted into kinetic energy and heat.

290. Two steel balls of mass 5 kg and 10 kg have same kinetic energy, which ball is moving fast.

- (a) Kinetic energy does not depend on the speed of the system.
- (b) 5 kg ball is moving fast
- (c) Both balls are moving at the same speed
- (d) 10kg ball is moving fast

RRB ALP. & Tec. 30-08-2018(Shift-I)

Ans : (b) Let, velocity of 5kg ball = v_1

And, velocity of 10 kg ball = v_2 , $\left[\because K.E. = \frac{1}{2}mv^2 \right]$

$$\frac{1}{2}m_1v_1^2 = \frac{1}{2}m_2v_2^2$$

$$\frac{1}{2} \times 5v_1^2 = \frac{1}{2} \times 10v_2^2$$

$$v_1^2 = 2v_2^2$$

$$\Rightarrow v_1 > v_2$$

\therefore 5 kg ball is moving fast.

291. The energy contained in an object due to the change in position and shape is called.

- (a) Kinetic energy
- (b) Chemical energy
- (c) Nuclear energy
- (d) Potential energy

RRB ALP. & Tec. 29-08-2018(Shift-I)

Ans : (d) Potential energy is the energy in a body due to change in its position and shape.

The formula for potential energy depends on the force acting on that objects. For the gravitational force the formula is $P.E. = mgh$, where m is the mass in kilograms, g is the acceleration due to gravity (9.8 m / s² at the surface of the earth) and h is the height in meters.

292. The energy possessed by a body due to its change in position or shape is called -

- (a) Nuclear energy
- (b) Potential energy
- (c) Kinetic energy
- (d) Chemical energy

RRB Group-D 30-10-2018 (Shift-I)

Ans : (b) See the explanation of above question.

293. At the time of releasing an arrow in a drawn bow, the potential energy of the bow change

- (a) Chemical energy
- (b) Kinetic energy
- (c) Sound energy
- (d) Thermal energy

RRB ALP. & Tec. 30-08-2018(Shift-I)

Ans : (b) At the time of releasing an arrow from a drawn bow, the potential energy of the bow change in to the kinetic energy.

294. Which of the following is not an example of potential energy?

- (a) A compressed spring
- (b) Flowing water
- (c) A raised hammer
- (d) Water stored in a dam

RRB ALP. & Tec. 30-08-2018(Shift-II)

Ans : (b) The energy stored in a compressed spring is elastic potential energy. The flowing water is not an example of potential energy because the flowing water has kinetic energy.

295. There is a body falling from a mountain has?

- (a) Both Kinetic energy and Potential energy
- (b) Only Kinetic energy
- (c) Only Friction energy
- (d) Only Potential energy

RRB Group-D 17-09-2018(Shift-III)

Ans : (a) Body falling from a mountain has both kinetic energy and potential energy.

296. What will be the value of the kinetic energy of an object moving along the mass of 'm' if its speed is changed from 'v' to $2v$?

- (a) $E_k/2$
- (b) $4E_k$
- (c) there will be no change in E_k
- (d) $2E_k$

RRB ALP. & Tec. 09-08-2018(Shift-III)

Ans : (b) If, $E_k = \frac{1}{2}mv^2$

and $KE = \frac{1}{2}m(2v)^2$, $KE = \frac{1}{2}m4v^2$

$KE = 4 \times \frac{1}{2}mv^2$, Or $KE = 4E_k$

So kinetic energy become 4 times.

297. An object with the mass of 2 kg is thrown upward with the initial velocity 20 m/s after 2 seconds its kinetic energy will be -

- (a) 100J
- (b) 0J
- (c) 400J
- (d) 200J

RRB ALP. & Tec. 09-08-2018(Shift-II)

Ans : (b) According to Newton's first law

$$v = u - gt$$

Given,

$$u = 20 \text{ m/s}, t = 2 \text{ sec}, g = 10 \text{ m/s}^2$$

$$v = 20 - 10 \times 2, v = 0$$

So, after 2 second kinetic energy also be zero.

298. What will be the kinetic energy of an object weighing 22 kg moving at a speed of 5 m / s?

- (a) 275J
- (b) 110J
- (c) 1100J
- (d) 2750J

RRB ALP. & Tec. 09-08-2018 (Shift-II)

Ans : (a)

$$K.E. = \frac{1}{2}mv^2, m = 22 \text{ Kg}, v = 5 \text{ m/s}$$

$$E_k = \frac{1}{2} \times 22 \times 5 \times 5 = \frac{1}{2} \times 550 = [275J]$$

299. Falling coconut has -

- (a) Nuclear energy
- (b) Sound energy
- (c) Kinetic energy
- (d) Chemical energy

RRB Group-D 24-09-2018(Shift-II)

Ans : (c) Falling coconut has kinetic energy.

300. When an object of 11 kg is at a height of 5 m from the ground, then find the energy contained in it ?(g=9.8ms⁻²)

- (a) 539J
- (b) 528J
- (c) 588J
- (d) 520J

RRB Group-D 11-10-2018(Shift-III)

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Ans : (a) Given,
 $m = 11 \text{ kg}$, $h = 5 \text{ m}$, $g = 9.8 \text{ m/s}^2$
 $P.E. = mgh = 11 \times 9.8 \times 5 = 55 \times 9.8 = 539 \text{ J}$

301. When an object of 14 kg is at a height of 5 m from the ground, then find the energy contained in it ? ($g=9.8 \text{ ms}^{-2}$)
 (a) 528J (b) 686m
 (c) 686J (d) 668J

RRB Group-D 15-10-2018(Shift-II)

Ans : (c) Given,
 $m = 14 \text{ kg}$, $h = 5 \text{ m}$, $g = 9.8 \text{ m/s}^2$
 $P.E. = mgh = 14 \times 9.8 \times 5 = 686 \text{ J}$

302. When an object of 15 kg is at a height of 10 m from the ground, then find the energy contained in it ? ($g=10 \text{ ms}^{-2}$)
 (a) 1500Pa (b) 1500N
 (c) 1500ms⁻² (d) 1500J

RRB Group-D 31-10-2018(Shift-III)

Ans : (d) Given,
 $m = 15 \text{ kg}$, $h = 10 \text{ m}$, $g = 10 \text{ m/s}^2$
 $P = mgh = 15 \times 10 \times 10 = 1500 \text{ J}$

303. The kinetic energy of an object is 120J and its mass is 15 kg Find the velocity of the object-
 (a) 4 ms (b) 4 ms⁻¹
 (c) 4 ms⁻² (d) 4 ms²

RRB Group-D 09-10-2018(Shift-II)

Ans : (b)

$$\text{K.E.} = \frac{1}{2}mv^2$$

$$120 = \frac{1}{2} \times 15 \times v^2 \Rightarrow v^2 = \frac{120 \times 2}{15}$$

$$\Rightarrow v^2 = 16 \Rightarrow v = 4 \text{ ms}^{-1}$$

304. What is the kinetic energy of an object of mass 15 kg moving at the velocity of 8ms⁻¹?
 (a) 480J (b) 180.5J
 (c) 480ms (d) 187.5J

RRB Group-D 09-10-2018(Shift-II)

Ans : (a)

$$(\text{K.E.}) = \frac{1}{2}m.v^2$$

$$m = 15 \text{ kg}, V = 8 \text{ m/s}$$

$$\therefore \text{K.E.} = \frac{1}{2} \times 15 \times 8 \times 8 = 480 \text{ J}$$

305. When an object of 11 kg is at a height of 6 m from the ground, then find the energy contained in it? ($g=9.8 \text{ ms}^{-2}$)
 (a) 539J (b) 646.8J
 (c) 528J (d) 520J

RRB Group-D 15-10-2018(Shift-III)

Ans : (b) Given,
 $m = 11 \text{ kg}$, $h = 6 \text{ m}$, $g = 9.8 \text{ m/s}^2$
 $P.E. = mgh = 11 \times 9.8 \times 6 = 646.8 \text{ J}$

306. The bullet fired from the gun goes deep inside the target because it has –
 (a) Heat energy (b) Potential energy
 (c) Chemical energy (d) Kinetic energy

RRB Group-D 10-10-2018(Shift-III)

Ans : (d) The bullet fired from the gun goes deep inside the target because it contains kinetic energy. The velocity of the bullet fired from the gun is very

high and when it hits the target its velocity becomes zero in a very short time. Therefore, the rate of change in momentum of the bullet is very high, so the bullet moves deep within the target.

307. By the turbines flowing water and air are used for change in.....?

(a) Potential energy into electric energy
 (b) Nuclear energy into electric energy
 (c) Kinetic energy into electric energy
 (d) Chemical energy into electric energy

RRB Group-D 16-11-2018(Shift-III)

Ans : (c) The water flowing through the turbine are used to convert kinetic energy into electrical energy. The turbine operates on the basis of Newton's third law (the law of action-reaction).

308. What is the kinetic energy of a bullet when a bullet is fired from a gun?

(a) Less than gun (b) Infinite
 (c) More than gun (d) equivalent to gun

RRB Group-D 22-09-2018(Shift-I)

Ans : (c) Gun mass = m_1 , velocity = v_1
 Bullet mass = m_2 , velocity = v_2
 $\therefore m_1 > m_2 \dots \dots \text{(i)}$

By the rule of principle of conservation of momentum-
 $m_1 v_1 = m_2 v_2$

Multiplying by 1/2 and squaring on both sides -

$$\Rightarrow \frac{1}{2}(m_1 v_1)^2 = \frac{1}{2}(m_2 v_2)^2$$

$$\Rightarrow E_1 \cdot m_1 = E_2 \cdot m_2$$

$$\Rightarrow \frac{E_2}{E_1} = \frac{m_1}{m_2}$$

$$\Rightarrow \frac{E_2}{E_1} > 1 \quad \text{from (i) equation}$$

$$\Rightarrow E_2 > E_1$$

When a bullet is fired from a gun, the kinetic energy of the bullet is higher than that of the gun.

309. Mechanical energy – kinetic energy = ?

(a) Chemical energy (b) Potential energy
 (c) Electric energy (d) Nuclear energy

RRB Group-D 19-09-2018(Shift-III)

RRB Group-D 12-10-2018(Shift-II)

RRB Group-D 16-11-2018(Shift-III)

Ans : (b) Mechanical energy is due to the position or movement of an object. The formula for mechanical energy is,

Mechanical energy = kinetic energy + potential energy

Mechanical energy - kinetic energy = potential energy

310. What does mechanical energy equal ?

(a) Kinetic energy+ chemical energy
 (b) Kinetic energy+ potential energy
 (c) Kinetic energy+ heat energy
 (d) Kinetic energy + electric energy

RRB ALP. & Tec. 30-08-2018(Shift-I)

Ans : (b) See the explanation of the above question.

311. Mechanical energy is a combination of kinetic energy and –

(a) Heat energy (b) Chemical energy
 (c) Potential energy (d) Nuclear energy

RRB ALP. & Tec. 10-08-2018(Shift-II)

RRB ALP. & Tec. 13-08-2018(Shift-III)

Ans : (c) See the explanation of the above question.

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312. What is the sum of the kinetic energy and potential energy of an object is called ?

- (a) Gravitational energy
- (b) Mechanical energy
- (c) Electric energy
- (d) Kinetic energy

RRB Group-D 16-11-2018(Shift-I)

Ans : (b) See the explanation of the above question.

313. What is the sum of the kinetic energy and potential energy of an object is called ?

- (a) Mechanical energy
- (b) Latent energy
- (c) Chemical energy
- (d) Muscular energy

RRB Group-D 15-10-2018(Shift-I)

Ans : (a) See the explanation of the above question.

314. Mechanical energy is ?

- (a) Energy released by a moving object
- (b) Energy emitted during mechanical work
- (c) The sum of the kinetic energy and potential energy of an object
- (d) Equal to the rate of work done.

RRB Group-D 19-09-2018(Shift-I)

Ans : (c) See the explanation of the above question.

315. has two types of energy ?

- (a) Mechanical (b) Electric
- (c) Chemical (d) Sound

RRB Group-D 01-10-2018(Shift-I)

Ans : (a) See the explanation of the above question.

316. Potential energy and kinetic energy are the type of... ?

- (a) Mechanical energy (b) Nuclear energy
- (c) Electric energy (d) Chemical energy

RRB Group-D 12-11-2018(Shift-II)

Ans : (a) See the explanation of the above question.

317. An object of mass 15 kg is moving with uniform velocity that of 7 ms^{-1} . What is the kinetic energy of that object ?

- (a) 367.5 ms (b) 17.5 J
- (c) 367.5 J (d) 180.5 J

RRB Group-D 08-10-2018(Shift-III)

Ans : (c) According to question,

$$\text{Mass (m)} = 15 \text{ kg}$$

$$\text{Velocity (v)} = 7 \text{ ms}^{-1}$$

Thus, the kinetic energy of the object

$$\text{K. E.} = \frac{1}{2} \text{mv}^2$$

$$= \frac{1}{2} \times 15 \times 7 \times 7$$

$$= \frac{1}{2} \times 735 = 367.5 \text{ J}$$

318. An object of 12 kg is placed at a certain height from the ground. If the potential energy of the object is 600 J, find the height of the object with respect to ground. ($g = 10 \text{ ms}^{-2}$)

- (a) 5 ms^2 (b) -5 m
- (c) 5 ms^{-2} (d) 5 m

RRB Group-D 04-10-2018(Shift-I)

Ans : (d) Given,

$$\text{Mass (m)} = 12 \text{ kg}$$

$$\text{Potential Energy (P.E.)} = 600 \text{ J}$$

$$\text{Acceleration due to gravity (g)} = 10 \text{ m/s}^2$$

$$\text{Potential energy (P.E.)} = \text{mgh}$$

$$600 = 12 \times 10 \times h$$

$$\therefore h = \frac{600}{120} = 5 \text{ m}$$

319. In which of the following energy is kinetic energy ?

- (A) A bullet fired by a gun
- (B) A fast moving railway engine
- (C) Speed of a simple pendulum
- (a) A and C (b) B and C
- (c) A and B (d) A, B and C

RRB Group-D 25-10-2018(Shift-II)

Ans : (d) Examples of kinetic energy –

- A bullet fired by a gun
- A fast moving railway engine
- Speed of a simple pendulum

320. The kinetic energy of an object of mass 10kg moving at a speed of 6 ms^{-1} is –

- (a) 18 J (b) 180 J
- (c) 1.80 J (d) 360 J

RRB Group-D 28-09-2018(Shift-III)

Ans : (b) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity.

$$\text{K.E.} = \frac{1}{2} \text{mv}^2$$

$$\text{Here, m} = 10 \text{ kg and v} = 6 \text{ ms}^{-1}$$

$$\text{Then, K.E.} = 10 \times 6 \times 6/2 = 180 \text{ J}$$

321. Which of the following statement regarding energy is not true ?

- (a) Energy is not a physical substance
- (b) Energy is the measure of the ability to perform a task
- (c) Energy can be stored and measured in many ways
- (d) The energy released during conversion goes into vacuum

RRB Group-D 23-10-2018(Shift-II)

Ans : (d) The energy released during conversion goes into vacuum. It is not true about energy.

322. An object of 20kg mass is moving at speed of 10 m/s . What is the kinetic energy obtained by the object?

- (a) 1000 Pa (b) 1000 J
- (c) 1000 Nm^{-2} (d) 1000 N

RRB Group-D 05-10-2018(Shift-III)

Ans : (b) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity.

$$\text{K.E.} = \frac{1}{2} \text{mv}^2$$

$$\text{Here, m} = 20 \text{ kg and v} = 10 \text{ ms}^{-1}$$

$$\text{K.E.} = 20 \times 10 \times 10/2 = 1000 \text{ J}$$

323. Calculate the potential energy obtained by a 20kg hammer, when it is raised to a height of 10 m ?

- (a) 3000 Pa (b) 2000 J
- (c) 3000 W (d) 3000 N

RRB Group-D 05-10-2018(Shift-III)

Ans : (b) Potential energy = $\text{m} \times \text{g} \times \text{h}$

Here, P.E. = ?, m = 20 kg, h = 10 m and g = 10 m/s^2

$$\text{P.E.} = 20 \times 10 \times 10$$

$$= 2000 \text{ J}$$

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324. An object of 13kg mass is moving with constant speed of 5m/s, what will be kinetic energy contained in the object?

(a) 187.5J (b) 17.5J
(c) 162.5J (d) 162.5ms

RRB Group-D 11-10-2018(Shift-I)

Ans : (c) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity:

$$K.E. = \frac{1}{2}mv^2$$

Here, m = 13 kg and v = 5ms⁻¹

Then, K.E. = $13 \times 5 \times 5/2 = 162.5 \text{ J}$

325. What will be the kinetic energy of an object of mass 20kg moving at a speed of 5ms⁻¹?

(a) 250kg (b) 250J
(c) 250N (d) 250Pa

RRB Group-D 11-12-2018(Shift-II)

Ans : (b) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity:

$$KE = \frac{1}{2}mv^2$$

Here, m = 20 kg and v = 5ms⁻¹

Then, K.E. = $20 \times 5 \times 5/2 = 250 \text{ J}$

326. Formula for gravitational potential energy is -

(a) U=mgh₁h₂ (b) U=mgh
(c) U=mhG (d) U=1/2 mv²

RRB Group-D 23-10-2018(Shift-III)

Ans : (b) The equation for gravitational potential energy is U = mgh, where m is the mass in kilograms, g is the acceleration due to gravity (9.8 m/s² on Earth), and h is the height above the ground in meters

327. What is wrong statement about kinetic energy?

(a) During static state the energy contained in the object is called kinetic energy
(b) The energy received by an object based on its speed is known as kinetic energy
(c) K.E.=1/2(mv²)
(d) Moving objects have kinetic energy

RRB Group-D 12-11-2018(Shift-II)

Ans : (a) The energy contained in the static state is called potential energy. So, option (a) is incorrect. The kinetic energy is the additional energy of a body due to its linear velocity or angular velocity, or both. The kinetic energy is a scalar quantity, it has no direction. The kinetic energy of the body is expressed by K.E.

$$KE = \frac{1}{2}mv^2$$

328. An object moving with the uniform velocity of 4m/s has a kinetic energy of 120J. Find the mass of the object?

(a) 15N (b) 15kg
(c) 19Pa (d) 15W

RRB Group-D 01-10-2018(Shift-I)

RRB Group-D 01-10-2018(Shift-III)

Ans : (b) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity:

$$K.E. = 1/2 m v^2$$

Here, m = ? and v = 4 ms⁻¹ and K.E. = 120J

Then, 120 = m×4×4/2

m = 15 kg

329. The kinetic energy of an object of mass m moving at a speed of 5 ms⁻¹ is 25J. What will be its kinetic energy when its speed will be double?

(a) 100J (b) 50J
(c) 100N (d) 50N

RRB Group-D 01-10-2018(Shift-II)

Ans : (a) Mass of object = m kg
Velocity of object = 5 m/s

$$\text{Kinetic energy} = 25 \text{ J}$$

$$\therefore \text{Kinetic energy} = \frac{1}{2} \times m \cdot v^2$$

$$25 = \frac{1}{2} \times m \times 5^2$$

$$\therefore m = 2 \text{ kg}$$

New velocity = $2 \times \text{Initial velocity} = 2 \times 5 = 10 \text{ m/s}$

$$\therefore \text{New kinetic energy} = \frac{1}{2} \times 2 \times 10 \times 10 = 100 \text{ J}$$

330. When an object of 12kg is at a height of 5m from the ground, then the energy contained in it will be? (g=9.8ms⁻²)

(a) 539J (b) 520J
(c) 528J (d) 588J

RRB Group-D 12-10-2018(Shift-I)

Ans : (d) According to question,
mass (m) = 12 kg
height (h) = 5 m
acceleration due to gravity (g) = 9.8 m/s²
Energy stored in the object is potential energy = mgh
= $12 \times 5 \times 9.8 = 588 \text{ J}$

331. What is the change in the total energy of a body falling freely towards the earth?

(a) Does not change
(b) Initially there will be decrease and after there will be increase
(c) It will increase
(d) It will decrease

RRB Group-D 13-12-2018(Shift-II)

Ans : (a) There is no change in the total energy of the body that is falling freely towards the Earth.

332. An object of 10kg is moving at a speed of 5m/s. What will be the kinetic energy of object?

(a) 125J (b) 2J
(c) 25J (d) 50J

RRB Group-D 10-10-2018(Shift-I)

RRB Group-D 19-09-2018(Shift-I)

Ans : (a) Kinetic energy is directly proportional to the mass of the object and to the square of its velocity.

$$K.E. = \frac{1}{2}mv^2$$

here, m = 10 kg, v = 5 m/s

$$\text{Kinetic energy} = \frac{1}{2} \times 10 \times (5)^2 = 5 \times 25 = 125 \text{ Joule}$$

333. Just before hitting the earth, the kinetic energy of an object of mass 2 kg is 400 J. At which height it was dropped?

(a) 10m (b) 25m
(c) 20m (d) 15m

RRB Group-D 04-12-2018(Shift-II)

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Ans : (c) From conservation of energy, Kinetic energy of body before striking (hitting) the ground = potential energy of body at height h from the ground, P.E. = mgh here, $m = 2 \text{ kg}$, P.E. = 400 J & $g = 10 \text{ m/s}^2$
 $400 = mgh$
 $400 = 2 \times 10 \times h$
 $\Rightarrow h = 20 \text{ m}$.

334. Which of the following contains potential energy?
 (a) Dam water (b) Flying Aeroplane
 (c) A falling Aeroplane (d) Running runner

RRB Group-D 30-10-2018(Shift-II)

Ans : (a) Potential energy is the energy in a body due to its position or shape.
 Dam water has potential energy.

335. Which of the following objects will have potential energy?
 (a) Moving bullet (b) Flowing air
 (c) A rolling stone (d) Raised hammer

RRB Group-D 03-10-2018(Shift-II)

Ans : (d) The raised hammer has potential energy.

336. What is the kinetic energy of the bicycle having 10kg weight moving at a speed of 20m/s ?
 (a) 4000J (b) 400J
 (c) 200J (d) 2000J

RRB Group-D 28-09-2018(Shift-II)

Ans : (d)

$$KE = \frac{1}{2}mv^2$$

(here, $m = 10\text{kg}$, $v = 20\text{m/s}$)

$$= \frac{1}{2} \times 10 \times (20)^2 = \frac{1}{2} \times 10 \times 400 = \frac{4000}{2} = 2000 \text{ J}$$

337. An object of mass 14kg is moving at the velocity of 5m/s. Find the kinetic energy contained in an object?
 (a) 180.5J (b) 17.5J
 (c) 175m (d) 175J

RRB Group-D 11-10-2018(Shift-II)

Ans : (d)

$$\begin{aligned} KE &= \frac{1}{2}m \times v^2 \\ &= \frac{1}{2} \times 14 \times 5^2 \\ &= \frac{1}{2} \times 14 \times 25 \\ &= 175 \text{ J} \end{aligned}$$

338. Which of the following does not have kinetic energy?
 (a) A rolling stone (b) Falling coconut
 (c) Raised hammer (d) Moving car

RRB Group-D 08-10-2018(Shift-II)

Ans : (c) Kinetic energy is the energy that is caused by the motion of an object, such as the energy of a rolling stone, the energy of a falling coconut and, the energy of a moving body, etc. The raised hammer has potential energy. Potential energy is due to the specific position or the shape of an object.

Mechanical energy = Kinetic energy + Potential energy

339. Which of these objects does not have kinetic energy?

(a) Flowing wind (b) Raised hammer
 (c) Falling stone (d) Moving bullet

RRB Group-D 05-10-2018(Shift-II)

Ans : (b) See the explanation of the above question.

340. The energy of 9800J was used to lift the 70kg weight at which height the weight was lifted ?

(a) 14m (b) 140m
 (c) -140m (d) -14m

RRB Group-D 17-09-2018(Shift-III)

Ans : (a) $PE = mgh$
 here, $PE = 9800 \text{ J}$, $m = 70 \text{ kg}$ & $g = 10 \text{ m/s}^2$

$$9800 = 70 \times 10 \times h$$

$$9800 = 700 \times h$$

$$h = \frac{9800}{700} = 14\text{m}$$

341. What is the potential energy of an object of mass 40 kg when it is lifted at a height of 5m above the ground?

(a) 200W (b) 2000J
 (c) 2000W (d) 200J

RRB Group-D 15-11-2018(Shift-I)

Ans : (b) $(U) = mgh$
 here, $m = 40 \text{ kg}$, $h = 5 \text{ m}$ & $g = 10 \text{ m/s}^2$
 Potential energy, $(U) = 40 \times 10 \times 5 = 2000 \text{ J}$

342. During the free falling of an object –

(a) The kinetic energy increase
 (b) The potential energy increase
 (c) The kinetic energy decrease
 (d) There is no change in kinetic energy

RRB Group-D 15-11-2018(Shift-I)

Ans : (a) When an object is in a static state, it has potential energy but when it is dropped down freely, the energy generated due to its motion is called kinetic energy. But as the body moves downwards, the force of gravity acts on it, which increases the kinetic energy as its speed increases.

343. If the velocity of an object moving at a certain height is increase 4 times, then what will be the change in the potential energy of the object?

(a) Potential energy will be constant
 (b) Potential energy will be half of its original value
 (c) Potential energy will be doubled
 (d) Potential energy will be 4 times of its original value

RRB Group-D 15-11-2018(Shift-II)

Ans : (a) The energy that exists in each object due to its position or shape is called potential energy. According to the question, increasing the velocity of an object moving at a certain height four times will change its kinetic energy and not the potential energy. Therefore, potential energy of that object will remain constant.

344. How would energy be converted while cycling ?

(a) Potential energy is converted into muscular energy
 (b) The chemical energy is converted into muscular energy then kinetic energy
 (c) Chemical energy is converted into mechanical energy
 (d) Mechanical energy is converted into kinetic energy

RRB Group-D 05-11-2018(Shift-II)

Ans : (b) While cycling, chemical energy is converted into muscular energy and then kinetic energy.

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Ans. (b) : When a body is immersed in a fluid, an upward force is exerted by the fluid on the body. This upward force is equal to the weight of the fluid, displaced by the body and is called the force of buoyancy or simply buoyancy.

786. If you fill water in glass and ice cube. What happens when ice cube completely melts?

- (a) Water will flow out
- (b) All the snow will sit in the bottom
- (c) Water level will remain the same
- (d) Water level will decrease with change

RRB Group-D 01-10-2018 (Shift-II)

Ans. (c) After the ice cube melts completely the water level remains the same and no water will displaced. Now fulfilled by the amount of water present in the ice cube. After melting, the amount of water in the ice cube will remain same.

787. When an object sinks, the up thrust of the fluid on the object is :

- (a) Greater than the weight of the object
- (b) Less than the weight of the object
- (c) Same as the weight of the object
- (d) Zero

RRB Group-D 09-10-2018 (Shift-II)

Ans. (b) : If the up thrust (buoyant force) is less than the weight of the object, then the object will sink. The density of the object is greater than the density of the fluid, the object will sink.

788. Upthrust force and weight of object would be-

- (a) In the below direction
- (b) In the opposite direction
- (c) Up above
- (d) In the same direction

RRB Group-D 05-10-2018 (Shift-III)

Ans. (b) The upward buoyant force that is exerted on a body immersed in a fluid, whether partially or fully submerged, is equal to the weight of the fluid that the body displaced and acts in the upward direction at the center of mass of the displaced fluid. In this condition the Upthrust force (buoyant force) and the weight of the object would be in the opposite direction.

789. What is the force acting perpendicular to plane?

- (a) Upthrust
- (b) Abusive
- (c) Pressure
- (d) Pull

RRB Group-D 15-10-2018 (Shift-III)

Ans. (a) A force acting perpendicular to a plane is called a buoyancy force or upthrust force. The property of a fluid, due to which it exerts an upward force on objects, is called uplift/buoyant force. This force acts on the centroid of the volume of fluid displaced by objects, which is called the centre of buoyancy. It was first studied by Archimedes.

790. Which of the following is not based on the principle of Archimedes?

- (a) Hydrometer
- (b) Submarine
- (c) Lactometer
- (d) Odometer

RRB Group-D 03-10-2018 (Shift-II)

Ans : (d) Odometer is not based on Archimedes' principle. The Hydrometer is based on the principle of Archimedes. According to 'Archimedes' principle, "the buoyancy force exerted on an object in a liquid equal to the weight of the liquid displaced by that object."

791. What will be the buoyancy force exerted by the water?

- (a) Less than the weight of the item
- (b) Zero
- (c) Equal to the weight of the water displaced by the object
- (d) Over load

RRB Group-D 05-10-2018 (Shift-I)

Ans. (c) The property of a fluid, due to which it exerts an upward force on an object partially or completely immersed in that fluid, is called a buoyancy or buoyancy force. This force acts on the centroid of volume of fluid displaced by object which is called centre of buoyancy. If an object floats in a liquid, the upward force exerted by the fluid or liquid on the object is equal to the weight of the liquid of fluid displaced by the object.

792. What is the magnitude of buoyancy force depends on?

- (a) The mass
- (b) The density
- (c) Temperature
- (d) Volume

RRB Group-D 03-10-2018 (Shift-I)

Ans : (b) The magnitude of buoyancy force depends on the density of the liquid. When an object is immersed in a fluid, the fluid exerts an upward force on the object known as buoyancy force or up thrust. The buoyancy force is proportional to the density of the liquid and volume of fluid displaced by the object.

793. The force of buoyancy depends on the density and of the liquid displaces.

- (a) The direction
- (b) Volume
- (c) Power
- (d) Energy

RRB JE 31.05.2019 (Shift-III)

Ans. (b) The buoyancy force is equal to weight of the liquid displaced by an object which is directly proportional to the density of the liquid and volume of the liquid displaced.

(v) Pressure

794. Pressure is defined as-

- (a) Weight per unit cube
- (b) Force per unit area
- (c) Density per unit cube
- (d) Mass per unit cube

RRB Group-D 16-10-2018 (Shift-I)

RRB Group-D 05-12-2018 (Shift-I)

Ans. (b) The force exerted on the unit area of a surface is called pressure.

We know that,

$$\text{Pressure (P)} = \frac{\text{Force (F)}}{\text{Area (A)}}$$

S.I. unit of Pressure N/m^2 . It is also called Pascal. Pressure is a scalar quantity.

795. Pressure is measured by-

- (a) Mass and density
- (b) Work done
- (c) Force and area
- (d) Force and distance

RRB NTPC 30.03.2016 (Shift-I) Stage Ist

Ans : (c) Pressure is measured by force and area.

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

⇒ The unit of Pressure is Pascal (N/m^2).

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796. If the area is small for a given force, the pressure will be-

(a) Change (b) Less
(c) More (d) Fixed

RRB Group-D 10-10-2018 (Shift-I)

Ans : (c) The force per unit area is called pressure. Therefore, the higher the area will be the lower the pressure, and the lower the area greater the pressure because pressure is directly proportional to force and inversely proportional to area.

$$\uparrow \text{Pressure (P)} = \frac{\text{Force (F)}}{\text{Area (A)} \downarrow}$$

The SI unit of pressure is (N/m²), which is also known as 'Pascal' (Pa).

797. Which of the following is dimension of pressure-

(a) MLT⁻² (b) ML⁻¹T⁻²
(c) ML⁻²T⁻² (d) ML⁻¹T⁻¹

RRB SSE (21.12.2014, Set-07, Yellow paper)

Ans : (b) Dimension of Pressure = [ML⁻¹T⁻²]

$$\boxed{\text{Pressure} = \frac{\text{Force}}{\text{Area}}}$$

Force = Mass × Acceleration

$$= \text{Kg} \times \frac{\text{Meter}}{\text{Second}^2} = [\text{MLT}^{-2}]$$

Area = Length × Width

$$= \text{meter} \times \text{meter} = \text{meter}^2 = [\text{L}^2]$$

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}} = \frac{[\text{MLT}^{-2}]}{[\text{L}^2]} = [\text{ML}^{-1} \text{T}^{-2}]$$

798. Pressure is defined as-

(a) Product of mass and acceleration
(b) Weight per unit volume
(c) Mass per unit volume
(d) Thrust per unit area

RRB Group-D 12-12-2018 (Shift-I)

Ans. (d) The force/thrust exerted on the surface per unit area is called pressure in other words pressure is defined as thrust on per unit area. Thrust is a force which is exerted on the surface of an area in upward or downward direction.

799. What is the thrust per unit area called?

(a) Current (b) Force
(c) Pressure (d) Area

RRB Group-D 11-10-2018 (Shift-III)

Ans. (c) See the explanation of above question.

800. If we increase the area of a given force, what will be the pressure-

(a) Goes up (b) Gets zero
(c) Gets reduced (d) Remains unchanged

RRB Group-D 02-11-2018 (Shift-III)

Ans : (c) The force exerted on the unit area of a surface is called pressure. The lower the surface area of an object, the more pressure it exerts on that surface and increase the area of a surface, the pressure on that surface will be less.

$$\downarrow \text{Pressure (P)} = \frac{\text{Force (F)}}{\text{Area (A)} \uparrow}$$

The SI unit of pressure is 'Pascal' (Pa) or N / m².

801. As the depth increases from the free surface of a fluid, the pressure exerted by the liquid will be-

(a) Becomes zero (b) Gets reduced
(c) Increases (d) Remains unchanged

RRB Group-D 12-12-2018 (Shift-III)

Ans : (c) Pressure at a point in a fluid is = ρgh where ρ is the density of the liquid, h is the height or depth of the object from the surface, so pressure increases with the increase in depth.

802. As the depth decreases from the free surface of a fluid, the pressure exerted by the liquid will be-

(a) Remains unchanged (b) Becomes zero
(c) Gets reduced (d) Increases

RRB Group-D 10-12-2018 (Shift-III)

Ans. (c) : Pressure at a point in a fluid is = ρgh where ρ is the density of the liquid, h is the height or depth of the liquid from the surface, so pressure decreases with decrease in depth.

803. Which of the following increases when the pressure exerted by a solid decreases-

(a) Velocity (b) Momentum
(c) Area (d) Force

RRB Group-D 07-12-2018 (Shift-I)

Ans : (c) The pressure exerted by a solid decreases with increase in area.

$$\downarrow \text{Pressure (P)} = \frac{\text{Force (F)}}{\text{Area (A)} \uparrow}$$

The S.I. unit of Pressure is 'Pascal' (Pa) or N / m².

804. What is the pressure inside the aircraft cabin at altitude?

(a) Is similar to outside
(b) Less than outside
(c) More than outside
(d) Normal the pressure at sea level

RRB NTPC 29.03.2016 (Shift-III) Stage Ist

Ans : (c) The air pressure in all aircraft cabin is kept higher than the atmospheric pressure at high altitudes to avoid discomfort to passenger due to low air pressure outside the aircraft.

805. The pressure of air at a certain temperature is proportional to-

(a) Density (b) Distance
(c) Velocity (d) Volume

RRB Group-D 02-11-2018 (Shift-I)

Ans. (a) At certain temperature, pressure of the air is directly proportional to the density of air. If pressure on the gas is doubled density is also doubled.

(vi) Density

806. What is the density of water-

(a) 1000 kg / cubic meter
(b) 10 kg / cubic meter
(c) 1 kg / cubic meter
(d) 2 kg / cubic meter

RRB NTPC 18.04.2016 (Shift-II) Stage Ist

Ans : (a) The density of water is 1000 kg / m³.

807. Which of the following reasons, clouds to float in the sky?

(a) Low temperature (b) Low speed
(c) Low pressure (d) Low density

RRB NTPC Stage Ist 28.04.2016 (Shift-II)

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Ans : (d) The reason for clouds floating in the sky is their low density. Due to the low density, the weight of clouds remain low with respect to the buoyancy force in the air and they float.

808. Ice floats on water because its density-

- (a) Is greater than water
- (b) Is less than water
- (c) Is zero
- (d) Is like water

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (b) Ice floats on water because its density is less than the density of water. The density of water is maximum at 4°C.

809. The density of a substance is defined as-

- (a) Mass per unit volume
- (b) Product of mass and acceleration
- (c) thrust per unit area
- (d) Weight per unit volume

RRB Group-D 24-10-2018 (Shift-II)

RRB Group-D 11-12-2018 (Shift-II)

RRB NTPC 16.04.2016 (Shift-III) Stage Ist

Ans : (a) The density of an object is the ratio of its mass to its volume.

$$\text{Density } (\rho) = \frac{\text{mass } (m)}{\text{volume } (v)}$$

Unit of density is $\frac{\text{kg}}{\text{m}^3}$.

810. It which temperature is the density of water maximum?

- (a) 0°C
- (b) 100°C
- (c) 50°C
- (d) 4°C

RRB J.E. 2014 (14.12.2014 Red Paper)

Ans. (d) : The maximum density of water is at 4°C.

We know that, $\rho = \frac{m}{V}$

As the temperature of warm water decreases, the water molecules become slow down and the density increases. At 4°C, the cluster start forming, the formation of cluster makes the molecules be further apart.

811. The relative density of silver is 10.8. The density of water is 10^3 kgm^{-3} . What will be the density of silver in SI unit.

- (a) $10.8 \times 10^3 \text{ kgm}^{-3}$
- (b) $1.08 \times 10^3 \text{ kgm}^{-3}$
- (c) $108 \times 10^3 \text{ kgm}^{-3}$
- (d) $1.8 \times 10^3 \text{ kgm}^{-3}$

RRB Group-D 06-12-2018 (Shift-III)

Ans. (a)

$$\text{Relative density of silver} = \frac{\text{density of silver}}{\text{density of water}}$$

Density of silver = Relative density of silver \times density of water

Hence, from given data—

$$\text{Density of silver} = 10^3 \times 10.8 \text{ kgm}^{-3} = 10800 \text{ kgm}^{-3}$$

812. Which of the following substance density is greater than the density of water?

- (a) Cork
- (b) Ice
- (c) Iron nail
- (d) Thermocol

RRB Group-D 06-12-2018 (Shift-II)

Ans.(c) The density of iron nail is higher than the density of water, so it will sink into the water, while the density of the materials given in the other three options is less than the density of water, these three will float.

813. The density of silver is $10.8 \times 10^3 \text{ kgm}^{-3}$ and the density of water is 10^3 kgm^{-3} . What is the relative density of silver?

- (a) 10.8 kgm^{-1}
- (b) 10.8 kgm
- (c) 10.8
- (d) 10.8 kgm^{-2}

RRB Group-D 12-12-2018 (Shift-III)

Ans.(c)

$$\text{Relative Density} = \text{Silver Density} / \text{Water Density} \\ = 10.8 \times 10^3 / 10^3 = 10.8$$

There is no unit of relative density.

814. What is the relative density equal to-

- (a) Water density / Density of substance
- (b) Density of the components of a substance / Density of absolute matter
- (c) Density of substance / density of water
- (d) Material Density / Oil Density

RRB Group-D 22-10-2018 (Shift-II)

RRB JE 26.06.2019 (Shift-IV)

Ans.(c) The relative density of a substance taken as the ratio of the density of that substance to the density of water.

Hence, Relative density = density of material / density of water.

There is no unit of relative density.

(vii) Kinetic Theory

815. Which of the following state of substance has the maximum kinetic energy?

- (a) Gas
- (b) Metalloid
- (c) Solid
- (d) Liquid

RRB Group-D 19-09-2018 (Shift-II)

RRB Group-D 05-12-2018 (Shift-II)

Ans(a) The kinetic energy of particle is maximum in gaseous state. In gases particles are free to rotate with maximum speed as there is negligible force of attraction between the particles.

816. In which situation the molecular attraction is very strong?

- (a) Solid
- (b) Fluid
- (c) The Gas
- (d) Steam

RRB J.E. (14.12.2014, Green paper)

Ans.(a) The state in which the molecular force of attraction is very strong is called the solid state of the substance. The molecules in the solid are very close.

817. Which of the following statements is not true regarding the effect of increasing temperature on the distribution of molecular motion in a gas-

- (a) Most likely speed increases
- (b) The fraction of molecules increases with the maximum possible speed
- (c) Delivery becomes widespread
- (d) The area under the distribution curve remains the same as below the lower temperature value.

RRB Group-D 11-12-2018 (Shift-II)

Ans.(b) The effect of an increase in temperature on the distribution of molecular motion in gases increases the maximum possible speed. The distribution becomes wider and the area under the distribution curve remains the same as under the lower temperature but the potential speed of the molecules in that region As the fraction of the molecule does not increase hence

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statement (b) is not true. The kinetic energy of the molecules of gases is proportional to the ultimate temperature of the gaseous system, the gas molecules do not attract each other. They move independently.

818. According to gas kinetic theory, the absolute zero temperature is achieved only when-

- (a) The volume of the gas is zero
- (b) Gas pressure is zero
- (c) The kinetic energy of the molecules is zero
- (d) The specific heat of the gas is zero

RRB ALP & Tec. (29-08-18 Shift-I)

Ans.(c) According to gas kinetic theory, the absolute zero temperature achieved, when there will be no kinetic energy associated with molecule. So, no motion of molecule and they will become to stand still.

819. Which of the following options is true with respect to diffusion of gases with respect to solid and liquid?

- (a) Diffusion rate of a fluid is higher than that of gases or gas
- (b) Diffusion rate of gases is higher than that of liquid and / or solid
- (c) The diffusion rate of the solid is higher than that of liquid or gas.
- (d) Diffusion rates of gases are lower than those of liquids and solids.

RRB Group-D 02-11-2018 (Shift-III)

Ans. (b) Diffusion rate of gases is higher than that of liquid and / or solid because gas particle moves freely. The rate of diffusion is maximum in gases as space between the constituent particle of gases are larger as compared to both liquid and solids.

820. If the amount of water vapour in the air is high, what will be the rate of evaporation-

- (a) Will decrease
- (b) Will be zero
- (c) Will remain
- (d) Will increase

RRB Group-D 05-11-2018 (Shift-I)

Ans.(a) If the amount of water vapour in the air is high, then the rate of evaporation decreases. In the summer, the water evaporates by evaporation from rivers or ponds and the sea, etc. The rate of evaporation of water in winter is less than in summer.

821. Virtually the force exerted on a vessel wall by a gas molecules.

- (a) Stick to the wall of the pot
- (b) Decay of kinetic energy
- (c) Hitting the wall to be quick
- (d) Change in their momentum by hitting the wall

RRB J.E. 2014 (14.12.2014 Red Paper)

Ans.(d) The force exerted on the wall of the vessel by a gas molecule is due to the change in its momentum as the gas molecules hit the wall of the vessel.

822. The temperature during solid melting-

- (a) Can increase or decrease according to the nature of the substance
- (b) Grows up
- (c) Decreases
- (d) Do not change

RRB Group-D 22-09-2018 (Shift-II)

Ans.(d) When solid melts, the temperature remains the same, this is because the absorbed heat is utilized in breaking the forces of attraction between the particles and hence solid change to a liquid state without change in temperature.

5. Heat

(i) Temperature & Measurement of Temperature

823. -273.15°C temperature is equal to:

(a) 0 K	(b) 100 K
(c) 173 K	(d) 23 K

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (a) : -273.15°C temperature is equal to 0 Kelvin. Absolute temperature, also called thermodynamic temperature, is the temperature of an object on a scale where 0 is taken as absolute zero. Absolute temperature scale is Kelvin.

824. What is the freezing point of water on Kelvin scale?

(a) 173.15 K	(b) 373.15 K
(c) 473.15 K	(d) 273.15 K

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : The freezing point of water is 273.15 K on the Kelvin scale. SI unit of Temperature measurement is Kelvin . The chemical formula of water is H_2O . At 4°C water has maximum density and minimum volume.

825. At which temperature is the density of water maximum?

(a) 247 K	(b) 244 K
(c) 277 K	(d) 273 K

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (c) : The temperature At 4°C or 277 Kelvin(K) turns out to be the temperature at which water has the highest density. If we heat it or cool it, it will expand. The expansion of water when we cool it to lower temperatures is unusual, since most liquids contract when they're cooled. At 277K of temperature is the density of water maximum due to anomalous property of water.

826. At what temperature will the water density be maximum?

(a) 0°C	(b) 4°C
(c) 39°C	(d) 100°C

ALP Stage -II 22.01.2019 (shift - II)

RRB NTPC Stage Ist 28.04.2016 (Shift-I)

Ans. (b) See the explanation of above question.

827. ${}^{\circ}\text{F} = \text{_____} {}^{\circ}\text{C}$

(a) 15	(b) 25
(c) 35	(d) 45

ALP Stage -II 22.01.2019 (shift - II)

Ans. (c) : From $\frac{C}{5} = \frac{F - 32}{9}$

$$\frac{C}{5} = \frac{95 - 32}{9}$$

$$\frac{C}{5} = \frac{63}{9}$$

$$C = 35^{\circ}\text{C}$$

828. _____ Celsius = 167 Fehreheit.

(a) 103	(b) 198
(c) 348	(d) 75

ALP Stage -II 23.01.2019 (shift - II)

