

RRB

Railway Recruitment Board

Junior Engineer

CBT 1 : 2026

Computer Based Test - Stage 1

- General Science
- General Awareness

Comprehensive Theory *with* Practice Questions
& Previous Years' Solved Questions





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RRB-Junior Engineer : General Science & General Awareness

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Preface

The post of Railway Recruitment Board-Junior Engineer has always been preferred by Engineers due to job stability. Indian Railways is one of the biggest Government employers in India. With the exam being just a few months away, it is time for the candidates planning to appear for the exam to pull up their socks and start their RRB-JE preparation.

The RRB-JE exam is conducted in two stages as shown in table given below.



Papers	Subjects	Maximum Marks	Duration
CBT-1 : Objective Type	(i) Mathematics	30 Marks	90 Minutes
	(ii) General Intelligence and Reasoning	25 Marks	
	(iii) General Awareness	15 Marks	
	(iv) General Science	30 Marks	
	Total	100 Marks	
CBT-2 : Objective Type	(i) General Awareness	15 Marks	120 Minutes
	(ii) Physics and Chemistry	15 Marks	
	(iii) Basics of Computers and Applications	10 Marks	
	(iv) Basics of Environment and Pollution Control	10 Marks	
	(v) Technical Abilities (viz, CE, ME, EE, EC, CS etc)	100 Marks	
	Total	150 Marks	
Note: There shall be negative marking for incorrect answers in CBTs. Each question carries 1 mark and 1/3rd of the marks allotted for each question shall be deducted for each wrong answer. Candidates shortlisted in Stage 1 will be called for Stage 2.			

This book comprises both the General Science & General Awareness subjects. Besides, previous years' RRB-JE questions have been also included in a separate section. MADE EASY has taken due care to present detailed theory and MCQs without compromising the accuracy of answers.

Apart from Railway Recruitment Board-Junior Engineer Exam, this book is also useful for Public Sector Examinations and other competitive examinations for engineering graduates. I hope this book will prove as an important tool to succeed in RRB-JE and other competitive exams.

I have true desire to serve student community by providing good source of study materials and quality guidance. Any suggestion from the readers for improvement of this book is most welcome.

With Best Wishes
B. Singh (Ex. IES)
CMD, MADE EASY Group



Exam Syllabus

(Computer Based Test-First Stage)

Mathematics: Number systems, BODMAS, Decimals, Fractions, LCM and HCF, Ratio and Proportion, Percentages, Mensuration, Time and Work, Time and Distance, Simple and Compound Interest, Profit and Loss, Algebra, Geometry, Trigonometry, Elementary Statistics, Square Root, Age Calculations, Calendar & Clock, Pipes & Cistern.

General Intelligence and Reasoning: Analogies, Alphabetical and Number Series, Coding and Decoding, Mathematical operations, Relationships, Syllogism, Jumbling, Venn Diagram, Data Interpretation and Sufficiency, Conclusions and Decision Making, Similarities and Differences, Analytical reasoning, Classification, Directions, Statement – Arguments and Assumptions etc.

General Awareness: Knowledge of Current affairs, Indian geography, culture and history of India including freedom struggle, Indian Polity and constitution, Indian Economy, Environmental issues concerning India and the World, Sports, General scientific and technological developments etc.

General Science: Physics, Chemistry and Life Sciences (up to 10th Standard CBSE syllabus).



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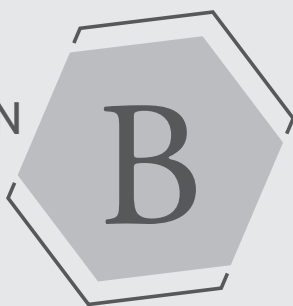
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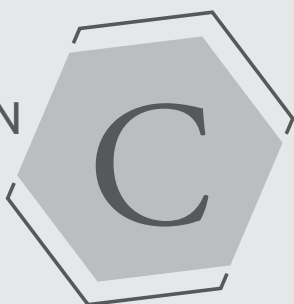
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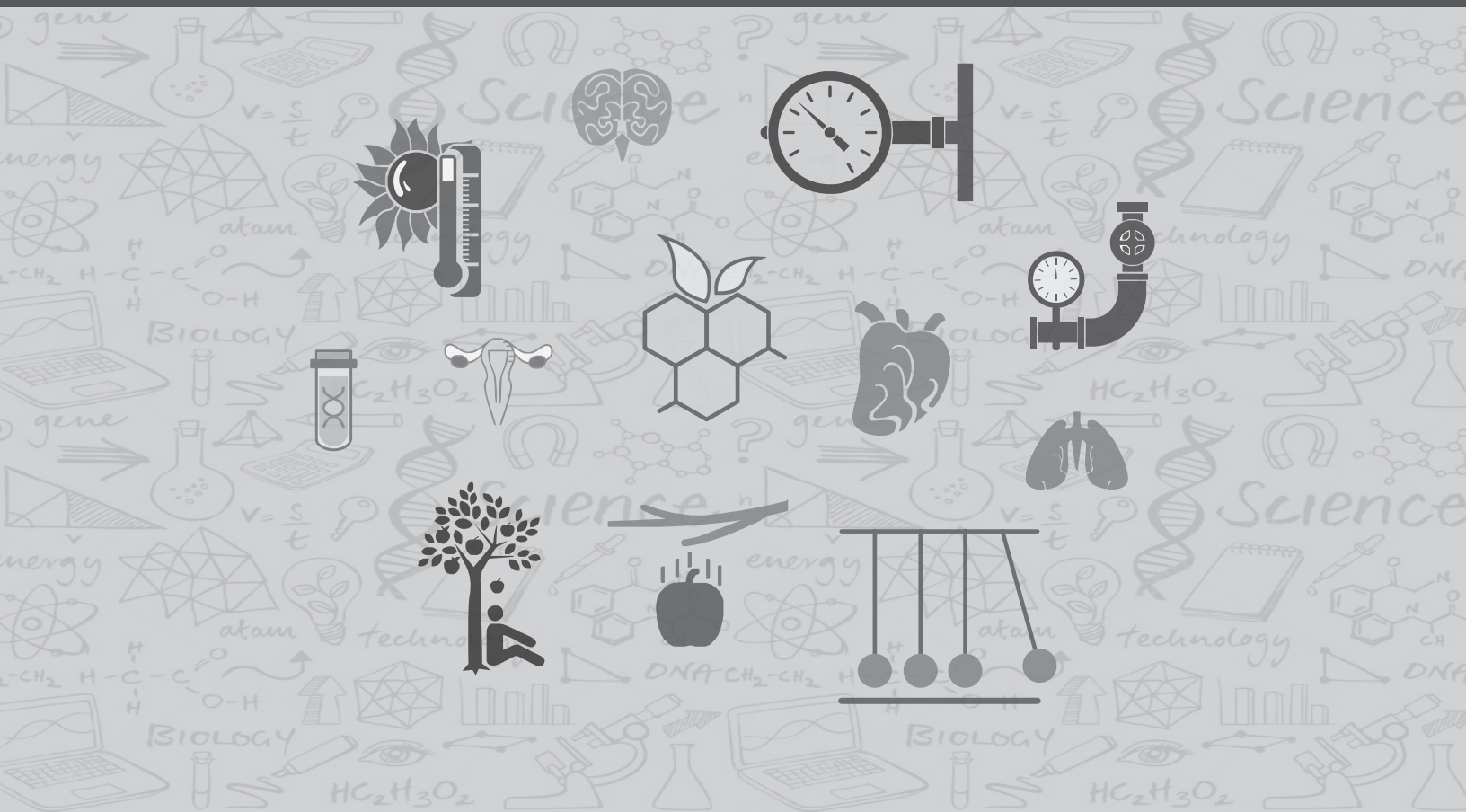
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General Science

Railway Recruitment Board (RRB) | Junior Engineer Examination



Physics

1

Chapter

Physics is a branch of science which is concerned with all aspects of nature on both the microscopic and macroscopic level. Its scope of study encompasses not only the behavior of objects under the action of forces but also the nature of gravitational, electromagnetic, nuclear forces among others. The ultimate objective of physics is to formulate comprehensive principles that bring together and explain all such phenomena.

UNITS & MEASUREMENT

Unit & Measurement

- Unit is the chosen standard used for measuring a physical quantity.
- There are basically two types of unit:
 - 1. Fundamental Unit:** These units are a set of measurements, defined arbitrarily and from which other units are derived. Examples: meter, kilogram, second, etc.
The fundamental unit of some of the physical quantities are given below:

International System of Units (S.I.)		
Physical	Fundamental	Symbol
Mass	Kilogram	kg
Length	Metre	m
Time	Second	s
Temperature	Kelvin	K
Electric-current	Ampere	A
Luminous intensity	Candela	Cd
Quantity of matter	Mole	mol

Systems of units	Length	Mass	Time
C.G.S. System	Centimetre	Gram	Second
F.P.S. System	Foot	Pound	Second
M.K.S. System	Metre	Kilogram	Second

- 2. Derived Unit:** All the units which are expressed in terms of fundamental units are known as derived units. Examples: Newton, Joule, etc.
- Internationally, there are four types of unit systems. These are:
 - 1. S.I. Units/System:** It is the modern form of the metric system, and is the most widely used system of measurement. It comprises a coherent system of units of measurement built on seven base units namely kilogram, meter, second, candela, ampere, kelvin and mol.
 - 2. CGS System:** The centimeter-gram-second (CGS) system of units is a variant of the metric system based on centimetre as the unit of length, gram as unit of mass, and the second as the unit of time.
 - 3. FPS System:** The foot-pound-second (FPS) system is a system of units built on three fundamental units: the foot for length, the pound for mass and the second for time.
 - 4. MKS System:** The MKS system of units is a physical system of units that expresses any given measurement using base units of the metre, kilogram, and second.

MOTIONS



Basics of Motion

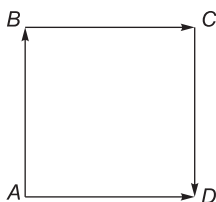
A body is said to be in motion if it changes its position with respect to its surroundings as time goes on. A body is said to be at rest if it does not change its position with time, with respect to its surroundings.

Types of Motion

- When a particle or a body moves along a straight path, its motion is Rectilinear or translatory motion.
- When a particle or a body moves in a circular path, its motion is circular motion. When a body spins about its own axis, it is said to be in rotational motion.
- When a body moves to and fro or back and forth repeatedly about a fixed point in a definite interval of time, it is said to be in vibrational or oscillatory motion.

The path travelled by an object during its motion is called trajectory. The actual path length during the motion is called distance and, the straight distance between the initial and final position of the motion in a particular direction is called displacement.

Let a particle travel, starting from point *A* and go to point *D* along the path *ABCD* in a given interval of time. The total path length (= *AB* + *BC* + *CD*) is the distance travelled and the shortest path length (*AD*) in the direction *A* to *D* is the displacement within the same time-interval.



Speed

The time rate of change of position of an object in any direction i.e. the rate of change of distance of an object with respect to time is known as speed.

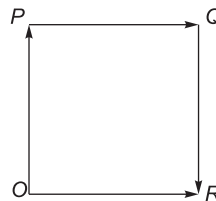
$$\text{Speed} = \frac{\text{displacement}}{\text{time taken}}$$

Velocity

The rate of change of displacement of an object with respect to time is known as velocity.

$$\text{Velocity} = \frac{\text{displacement}}{\text{time}}$$

Let a square *OPQR* of side length 2 metre. A particle travels along its side starting from *O* to *R* via *P* and *Q*. It takes a total time of 2 seconds. The total distance travelled is *OP* + *PQ* + *QR* = 2 + 2 + 2 = 6 metres whereas the total displacement is *OR* = 2 metres. Hence



$$\text{Average Speed} = \frac{\text{distance}}{\text{time}} = \frac{6}{2} = 3 \text{ m/s}$$

$$\text{Average Velocity} = \frac{\text{displacement}}{\text{time}} = \frac{2}{2} = 1 \text{ m/s}$$

Acceleration

The rate of change of velocity with respect to time is called acceleration.

$$\text{Acceleration} = \frac{\text{Change in velocity}}{\text{time taken}}$$

When a body completes equal displacement in equal interval of time, its velocity is constant and hence, it does not have an acceleration. When a body shows equal change in velocity in equal interval of time its velocity is not constant but it has a constant acceleration.

Equation of Motion

For a body moving with a uniform velocity

If a body completes a displacement '*S*' in time '*t*' with a uniform velocity '*V*', then,

$$\text{Displacement} = \text{velocity} \times \text{time}$$

$$\text{or } S = vt \quad \dots(i)$$

For a body moving with a uniform acceleration

If a body starting with an initial velocity '*u*' moves with a uniform acceleration '*a*' for a time '*t*' and attains a final velocity '*v*' after travelling a displacement '*s*' then,

$$S = ut + \frac{1}{2}at^2 \quad \dots(iii)$$

$$v^2 = u^2 + 2as \quad \dots(iv)$$

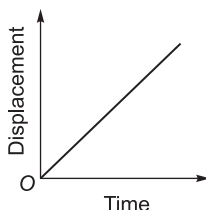
When the velocity of a body increases, it has a positive acceleration and when the velocity decreases, it has a negative acceleration.

This negative acceleration is called deceleration or retardation. When a body is released from a height, its velocity increases by 9.8 m/s in every second and when a body is thrown above the earth's surface, its velocity decreases by 9.8 m/s in every second. This change in velocity every second is called acceleration due to gravity which is denoted by 'g'. Its average value at the earth's surface is 9.8 m/s². It is always directed towards the centre of the earth because of the gravitational pull. For a freely falling body, its acceleration is 9.8 m/s².

Position (Displacement)-Time Graphs

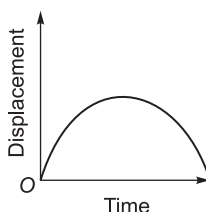
For a body moving with a uniform velocity

This graph comes as a straight line because in a uniform velocity the particle completes equal displacement in an equal interval of time.



For the motion of a body thrown vertically upwards

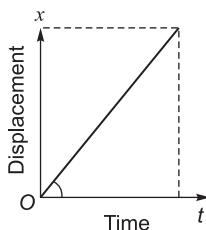
When the body moves up, its velocity continuously decreases due to gravity and finally becomes zero at the maximum height. Then, the body falls with an increasing velocity.



The slope of the position time graph is equal to the uniform velocity.

$$\text{Slope} = \frac{\text{Displacement}}{\text{Time}}$$

or $V = \frac{x}{t}$



Velocity-time Graph

For a uniformly accelerated motion the velocity-time graph is a straight line. The area under the velocity-time graph is equal to displacement.

∴ Displacement = Area under velocity time graph

$$= \text{Area of } \triangle OAB = \frac{1}{2} \times AB \times OB$$

Where $\frac{AB}{2} = \text{Average velocity (Var.)}$

$$= \frac{\text{Initial velocity} + \text{Final velocity}}{2}$$

or $V_{av} = \frac{u+v}{2}$ and $OB = \text{time } (t)$

∴ $S = \left(\frac{u+v}{2} \right) t$

∴ $V = u + at$

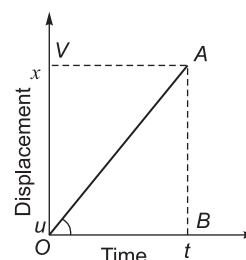
The slope of the velocity time graph is equal to acceleration.

In the figure, Slope = $\frac{AB}{OB} = \text{acceleration}$

and $OB = \text{time } (t)$

∴ $a = \frac{v-u}{t}$

or, $V = u + at$



Physical Quantities

Vectors

They have a definite magnitude and a definite direction, e.g. displacement, velocity, acceleration, force etc.

Scalars

They have definite magnitudes only and not direction. e.g. distance, speed, work, energy, power, electric charge etc.

Tensors

They have different magnitudes in different directions, e.g. Moment of inertia, stress etc.

In a motion, a body can have a constant speed but variable velocity like the motion of a body along a circular path. A particle may have zero displacement and zero velocity but non-zero distance and speed. When a body completes one revolution along a circular path in a given time period, the net displacement and velocity of the body will be zero but the distance and speed of the body must be non-zero.

The velocity and acceleration of a body may not necessarily be in the same direction and may not be zero simultaneously. The body in equilibrium may be at rest or may move with a constant velocity.

When a body is thrown upwards, it will go vertically until its vertical velocity becomes zero and it will return to the ground with the same velocity with which it was thrown.

When a body is thrown horizontally from a height or dropped from the same height in both cases it will be reaching to the ground simultaneously because in both the cases the body will be acted upon by the same vertically downward acceleration due to gravity (g).

A physical quantity having direction may or may not be a vector e.g. time, pressure, current-electricity, surface-tension etc. They have direction but are not vectors.

Linear-Momentum

It is the quantity of motion which a body possesses and is measured as the product of the mass and velocity of the body.

$$\text{Linear momentum} = \text{mass} \times \text{velocity}$$

Impulse

The total change in momentum is called the impulse. If a very large force acts for a very small time, the product of force and the time is equal to the impulse.

Inertia

The inability of a body to change by itself its state of rest or state of uniform motion along a straight line is called inertia of the body.

The inertia of a body is measured by its mass. Heavier the body, greater is the force required to change its state and hence greater is its inertia. Inertia of a body may be inertia of rest, inertia of motion or inertia of direction.

Newton's Laws of Motion

First Law of Motion

Every body continues to be in a state of rest or uniform motion in a straight line, except in so far as it may be compelled by force to change that state.' Newton's first law of motion defines inertia.

1. Inertia of Rest : The inability of a body to change by itself its state of rest.

- When a branch of a fruit tree is shaken, the fruits fall down. This is because the branch comes in motion and the fruits tend to remain at rest. Hence, they get detached.

- The dirt particles in a durree fall off if it is stricken by a stick. This is because the striking sets the durree in motion whereas the dirt-particles tend to remain at rest and hence fall.
- When a train starts suddenly, the passenger sitting inside tends to fall backwards. This is so because the lower part of the passenger's body starts moving with the train but the upper part tends to remain at rest.
- If a smooth paper having a coin on it placed on a table is suddenly drawn, the coin remains at the same place on the table due to inertia of rest.
- When a horse starts suddenly, the rider tends to fall backwards due to inertia of rest

2. Inertia of Motion : The inability of a body to change by itself its state of uniform motion.

- When a horse at full gallop stops suddenly, the rider on it falls forward because of inertia of motion of the upper part of the rider's body.
- When an athlete takes a long jump, he runs first for a certain distance before the jump. This is because his feet come to rest on touching the ground and the remaining body continues to move owing to inertia of motion.
- When train stops suddenly, a passenger sitting inside tends to fall forward. It happens because the lower part of the passenger's body comes to rest with the train but the upper part tends to continue its motion due to inertia of motion.
- A person jumping out of a speeding train may fall forward due to inertia of motion of his body. Hence, he should run a few steps on the platform in the direction of motion of train.

3. Inertia of Direction : The inability of a body to change by itself its direction of motion.

- The wheels of any moving vehicle throw out mud, if any, tangentially, due to the inertia of direction. The mud-guards over the wheels stop this mud, protecting the clothes, etc. of the person sitting on the bike.
- Use of an umbrella to protect us from rain is based on the property of inertia of direction because the rain drops cannot change their direction of motion.
- When a bus or a car rounds a curve suddenly, the person sitting inside is thrown outwards. It happens so because the person tries to maintain his direction of motion due to directional inertia while the vehicle turns.

- When a knife is sharpened by pressing it against a grinding stone, the sparks fly off tangentially because of the inertia of direction.
- When a stone tied to one end of a string is whirled and the string breaks suddenly, the stone spins off along the tangent of its circular path. It happens so because of the pull in the string was forcing the stone to move in a circle. As soon as the string breaks, the pull disappears. The stone becomes free and in a bid to move along the straight line flies off tangentially.

Second Law of Motion

The rate of change of linear momentum of a body is directly proportional to the external force applied on the body and this change takes place always in the direction of the applied force'.

The second law gives us a measure of force. When a force is applied on a body, its momentum and hence, velocity change. The change in velocity produces an acceleration in the body. The rate of change of linear momentum with time is equal to the product of the mass of the body and its acceleration which measures the magnitude of the applied force i.e.

$$\text{Force} = \frac{\text{Change in linear momentum}}{\text{time interval}}$$

$$= \text{mass} \times \text{acceleration}$$

or,

$$F = ma$$

When a body is moving with a uniform velocity along a straight line, it neither experience nor require an external force. This is because, the acceleration is due to change in the velocity of the body and the velocity remains constant because the acceleration is due to change in the velocity of the body and the velocity remains constant for a body moving with a uniform velocity along a straight line.

When a body changes its velocity or direction of its motion, its velocity changes too. It results in an acceleration which is possible only by the action of an external applied force. Hence, an accelerated motion is always due to an external force.

Application of the change in linear momentum (impulse) and second law of motion :

- Bogies of a train are provided with the buffers. These buffers avoid severe jerks during shunting of the train. Since force = change in momentum/time and the time of impact increases due to

presence of buffers. Hence, force during jerks decrease. It results in decrease in the chances of damage.

- Crockery items are wrapped in paper or straw pieces before packing because paper or straw acts as buffers. It changes the time of impact and hence, avoids the chances of damage during the jerks.
- An athlete should stop slowly, after finishing a fast race, so that the time of impact of his run increases at stop and hence, force experienced by him decreases.
- In cricket, a player lowers his hands while catching a cricket ball to avoid injury. In doing so, he increases the time of impact of the ball which in turn reduces the effect of the force on his hands.
- Shockers in the motor-vehicles reduce the effect of jerk/force by increasing the time of impact of the jerks given by an uneven road.
- In a head-on collision between two vehicles, change in linear momentum is equal to the sum of the linear momenta of the two vehicles. Since time impact is very small, hence an extra large force develops which results in maximum damage to the vehicles.
- When a person falls from a height on a concrete floor, the floor does not yield. The total change in linear-momentum is produced in a very small interval of time. Hence, the floor exerts a much larger force and the person receives more injury. But when a person falls on a heap of sand, the sand yields. The same change in linear momentum is produced in a much longer time. The average force exerted on the person by the heap of sand is, therefore, much smaller and hence the person is not hurt.

Third Law of Motion

"To every action, there is always, an equal and opposite reaction."

Here, the action is the force exerted by one body on the other body while the reaction is the force exerted by the second body on the first.

Significance of Third Law

It signifies that forces in nature are always in pairs. A single isolated force is not possible. Force of action and reaction act always on different bodies.

31. (b)
In the electrolysis of brine, negative ions (Cl^-) move to the Anode to form Chlorine gas, and positive ions (H^+) move to the Cathode to form Hydrogen gas. Sodium hydroxide (NaOH) forms near the cathode.
32. (d)
Noble gases like Argon have a complete octet and do not naturally form bonds with other atoms. Therefore, they exist as single atoms (monoatomic). Oxygen, Nitrogen, and Chlorine are all diatomic (O_2 , N_2 , Cl_2).
33. (c)
India consistently holds the 4th rank in the Global Firepower Index, trailing only the United States, Russia, and China.
34. (c)
During the refining of metals like copper, the insoluble impurities from the impure anode fall to the bottom of the tank, forming what is known as anode mud.
35. (c)
Indira Point, located on Great Nicobar Island, is the southernmost point of the Indian territory. (Kanyakumari is the southernmost point of the mainland).
36. (d)
The quality and taste of honey depend on the pasturage (flowers available for nectar).
A greater variety and abundance of flowers allow bees to collect more nectar and produce honey with better flavor profiles.
37. (d)
Hydrophobic means "water-fearing." In a soap micelle, the hydrophobic carbon chains cluster together towards the center to avoid contact with water, while the hydrophilic heads face outward.
38. (a)
Vanilla and Clove oil are olfactory indicators whose characteristic smells are destroyed when they react with a base (like NaOH).
40. (a)
Open Market Operations (OMOs) involve the buying and selling of government securities by the RBI to regulate the liquidity/money supply in the economy.
41. (d)
 $\text{PE} = mgh$. Since mass (m) is directly proportional to Potential Energy, halving the mass will halve the energy.
42. (d)
The larynx (voice box) is a structure primarily made of cartilage, which provides the necessary rigidity to keep the airway open while remaining flexible.



Railway Recruitment Board (RRB) | Junior Engineer Examination

General Science & General Awareness • Exam Date : 25 Feb. 2026 (Shift-3)

- Why are sulphide ores usually converted into oxides before the extraction of metals?
(a) Metal sulphides react faster with carbon
(b) Sulphide ores are unstable at room temperature
(c) Sulphide ores contain more gangue materials
(d) Metal oxides are easier to reduce than sulphides
- Under the Stand-Up India Scheme, bank loans from Scheduled Commercial Banks (SCBs) are provided in what range for eligible beneficiaries?
(a) 5 lakh to 50 lakh
(b) 25 lakh to 2 crore
(c) 1 crore to 5 crore
(d) 10 lakh to 1 crore

3. What is the primary composition of the stable composite developed by IIT Mandi that prevents 2D semiconductors from degrading?
- (a) Carbon nanotubes embedded in polymer matrix
(b) Boron nitride mixed with epoxy resin
(c) Tungsten disulfide (WS) encapsulated in polydimethylsiloxane (PDMS)
(d) Graphene combined with silicone
4. 'Utkal Diwas', which was celebrated on 1st April 2025, marks the anniversary of the statehood of
- (a) Chhattisgarh (b) Uttarakhand
(c) Telangana (d) Odisha
5. Why are brackets used in the formula $\text{Ca}(\text{OH})_2$?
- (a) To show ionic nature
(b) To balance oxygen atoms
(c) To indicate two hydroxide groups
(d) To represent molecular bonding
6. The average of the first 18 positive multiples of 11 is:
- (a) 104.5 (b) 18
(c) 11 (d) 99
7. A dentist uses a mirror to obtain a large image of a patient's tooth. Which mirror should the dentist use and why?
- (a) Plane mirror, because it gives a real image
(b) Concave mirror, because it gives a magnified image
(c) Spherical mirror, because it gives a virtual image
(d) Convex mirror, because it gives a magnified image
8. What is the primary material used to develop vermicompost?
- (a) Bacteria and viruses
(b) Earthworms
(c) Yeast
(d) Chemical fertilisers
9. How do check-dams help in improving agricultural water availability and soil quality?
- (a) They increase groundwater levels and reduce soil erosion.
(b) They directly irrigate fields with river water and increase soil erosion.
(c) They store water only for city use, and reduce soil erosion.
(d) They divert water away from farms and increase soil erosion.
10. Which observation supports the law of constant proportions for water?
- (a) Water boils at fixed temperature
(b) Water exists in three states
(c) Hydrogen and oxygen ratio is fixed
(d) Water conducts electricity weakly
11. In a micelle, which part faces outward toward water?
- (a) Hydrocarbon tail
(b) Ionic head
(c) Non-polar end
(d) Grease molecule
12. A student claims that two cars of equal mass, one moving at 40 km/h and another at 80 km/h, have the same kinetic energy if their engines provide the same power. What is the error in this reasoning?
- (a) The cars have equal energy if the engines are identical.
(b) Kinetic energy depends on the square of speed, not just on power supplied.
(c) Power supplied determines energy, regardless of speed.
(d) Both cars have equal kinetic energy since both cover the same distance.
13. A farmer wants to grow wheat with better baking quality and resistance to drought. Which two characteristics should be targeted in variety improvement?
- (a) Higher yield and wider adaptability
(b) Improved quality and abiotic resistance
(c) Improved quality and biotic resistance
(d) Wider adaptability and biotic resistance
14. As per the India Meteorological Department (IMD), what is the approximate total annual normal rainfall received in the Thar Desert, which has a coefficient of variation (CV) of about 38%?
- (a) 250 mm per year
(b) 200 mm per year
(c) 150 mm per year
(d) 50 mm per year

15. Which rivers have contributed to the formation of the Northwestern Plains of India?
(a) Krishna, Godavari, and Kaveri
(b) Satluj, Beas, and Ravi
(c) Ganga, Yamuna, and Brahmaputra
(d) Narmada, Tapi, and Mahanadi
16. Why does our palm feel cold when acetone or petrol is poured on it?
(a) The liquid blocks heat flow from surroundings
(b) The liquid increases moisture on skin surface
(c) The liquid absorbs heat from the skin to evaporate
(d) The liquid reacts chemically with our skin surface
17. Which region is the Sarhul festival, organised on 1st April 2025, particularly significant in?
(a) The southern states of India
(b) The Himalayan region
(c) The Chhotanagpur region and Jharkhand
(d) The coastal regions of India
18. How do rays parallel to the principal axis behave after reflection from a convex mirror?
(a) They actually converge at the focus.
(b) They appear to diverge from a point on the principal axis.
(c) They get reflected back along the same path.
(d) They pass through the centre of curvature.
19. Which of the following articles is INCORRECTLY matched with the Constitutional Provisions related to Parliament?
(a) Article 93 - Speaker and Deputy Speaker of the House of People
(b) Article 99 - Composition of the Council of States/Rajya Sabha
(c) Article 89 - Chairman and Deputy Chairman of Council of States
(d) Article 105 - Powers and Privileges of the Houses of Parliament
20. Which of the following situations is NOT an example of action and reaction forces?
(a) A swimmer pushing water backwards
(b) A bat hitting a cricket ball
(c) A ball thrown upward comes back down due to the pull of gravity.
(d) A rocket launching upwards
21. Which of the following statements best explains why humans are severely affected by biological magnification?
(a) Humans can break down toxins
(b) Humans are best decomposers in food chain
(c) Humans consume less food than other consumers in food chain
(d) Humans occupy the top trophic level in many food chains
22. Which of the following folk dances is performed to celebrate a good harvest and is popular in the states of Odisha and Chhattisgarh?
(a) Bhangra (b) Karma
(c) Garba (d) Rouf
23. The fluid content inside the plasma membrane is named:
(a) Chromatin
(b) Genes
(c) Cytoplasm
(d) Chromosomes
24. Which waste based difference between the renal artery and renal vein is directly related to excretory function?
(a) The renal vein has higher pressure
(b) The renal artery has more valves
(c) The renal artery contains more urea
(d) The renal vein contains more oxygen
25. A car suddenly changes direction while moving at constant speed. Which aspect of inertia is being demonstrated, and how does the car's mass influence this effect?
(a) The inertia of rest is demonstrated, and the car's mass does not affect direction changes.
(b) The inertia of speed is demonstrated, and a lighter car resists direction change more.
(c) Mass only affects speed, not direction, when a car turns.
(d) The inertia of direction is demonstrated, and a car with greater mass will resist the change in direction more.

26. If a body at rest is dropped from a certain height and takes 4 seconds to reach the ground, what is the approximate height from which it was dropped? (Take $g=10 \text{ m/s}^2$)
(a) 80 meters (b) 160 meters
(c) 40 meters (d) 100 meters
27. Which of the following is usually 'stored under high pressure'?
(a) N_2 (b) H_2
(c) Solid CO_2 (d) NaCl
28. Which of the following objectives is stated in Article 38 of the Indian Constitution?
(a) To establish military rule for national security
(b) To establish a social order based on justice - social, economic, and political
(c) To guarantee employment to all citizens
(d) To provide equal education opportunities for all
29. The Five Ps of Sustainable Development are:
(a) Poverty, Peace, Protection, Plant, Product
(b) Population, Peace, Production, Power, Partnership
(c) People, Peace, Power, Planet, Partnership
(d) People, Peace, Prosperity, Planet, Partnership
30. By the late 1960s, what major achievement did India attain in agriculture?
(a) Shifted entirely to organic farming
(b) Started exporting food grains
(c) Became self-sufficient in food grains
(d) Stopped using fertilizers
31. Who among the following has overtaken Yuzvendra Chahal to become India's highest wicket-taker in T20 Internationals at Eden Gardens in Kolkata on 22 January 2025?
(a) Jasprit Bumrah
(b) Kuldeep Yadav
(c) Mohammed Siraj
(d) Arshdeep Singh
32. Which of the following is/are correct about Tej Bahadur Sapru?
I. He helped Annie Besant to build up the Central Hindu College at Banaras.
II. He entered politics during the Home Rule movement.
III. He participated in the Round Table Conferences held between 1930 and 1932 in London.
- (a) Only I (b) Only II
(c) All I, II and III (d) Only II and III
33. Which of the following tissues ensures that food made in the leaves is delivered to all plant parts?
(a) Phloem (b) Mesophyll
(c) Xylem (d) Epidermis
34. Plant diseases are caused by pathogens transmitted through:
(a) Sunlight exposure
(b) Soil, water and air
(c) Crop residues alone
(d) Fertilisers and manure only
35. What conclusion can be drawn from the experiment in which potassium permanganate solution remains coloured even after repeated dilution?
(a) Particles of matter are extremely small in size
(b) Particles of matter are fixed and stationary
(c) Particles of matter are visible to naked eye
(d) Particles of matter occupy no space at all
36. Ozone shields the surface of the Earth from which type of radiation coming from the Sun?
(a) X rays (b) White light
(c) Infra-red (d) Ultra violet
37. Mr. W travelled 425 km, 946 km and 340 km at a speed of 5 km/hr, 43 km/hr and 34 km/hr, respectively. Find his average speed in km/hr.
(a) $14\frac{71}{117}$ (b) $14\frac{75}{117}$
(c) $14\frac{73}{117}$ (d) $14\frac{70}{117}$
38. Which of the following everyday mixtures is best classified as a suspension?
(a) Salt solution prepared in water
(b) Sugar completely dissolved in water
(c) Copper sulphate dissolved in water
(d) Chalk powder mixed with water
39. When dilute hydrochloric acid reacts with calcium carbonate, the gas evolved is passed through limewater. On passing the gas in excess, the milkiness disappears due to the formation of:

- (a) Calcium oxide
(b) Calcium hydrogen carbonate
(c) Calcium carbonate
(d) Calcium hydroxide
40. If the current in a wire is 2 amperes, how much charge flows through a cross-section in 5 seconds?
(a) 7 coulombs (b) 10 coulombs
(c) 0.4 coulombs (d) 2.5 coulombs
41. Why are metals such as sodium and calcium extracted by electrolytic reduction instead of heating with carbon?
(a) They decompose when heated with carbon
(b) They have greater affinity for oxygen than carbon
(c) They exist only as molten chlorides in nature
(d) They form unstable oxides at high temperature
42. India commemorated the birth anniversary of Rabindranath Tagore on May 7, 2025.
(a) 164th (b) 166th
(c) 160th (d) 162nd
43. What should be done in order to minimise waste production?
(a) Increase plastic usage
(b) Maximise plastic packaging
(c) Use non-biodegradable products
(d) Change and adapt sustainable lifestyle
44. When using the sign convention for spherical mirrors, which direction along the principal axis is considered positive?
(a) To the right of the origin (along + x-axis)
(b) To the left of the origin (along - x-axis)
(c) Upwards from the principal axis
(d) Downwards from the principal axis
45. What is the sign of the focal length for a convex lens?
(a) Zero (b) Variable
(c) Negative (d) Positive
46. A student uses a convex lens to project a tree image onto a wall. If the image is smaller than the tree, what is the tree's position?
(a) At twice the focal length (2F)
(b) Beyond twice the focal length (beyond 2F)
(c) Between the lens and its focal point
(d) At the focal point
47. Which demand of the Moderate leadership (1885-1905) reflected the objective of expanding Indian involvement in colonial decision-making?
(a) Curtailment of regressive indirect taxation
(b) Expansion of legislative councils for Indian representation
(c) Immediate transfer of political authority
(d) Preferential allocation of bureaucratic appointments

Answer Key**RRB JE | 25 Feb. 2026 (Shift-3)**

1. (d)	2. (d)	3. (c)	4. (d)	5. (c)	6. (a)	7. (b)	8. (b)	9. (a)
10. (c)	11. (b)	12. (b)	13. (b)	14. (c)	15. (b)	16. (c)	17. (c)	18. (b)
19. (b)	20. (c)	21. (d)	22. (b)	23. (c)	24. (c)	25. (d)	26. (a)	27. (c)
28. (b)	29. (d)	30. (c)	31. (d)	32. (c)	33. (a)	34. (b)	35. (a)	36. (d)
37. (c)	38. (d)	39. (b)	40. (b)	41. (b)	42. (a)	43. (d)	44. (a)	45. (d)
46. (b)	47. (b)							

Explanations**RRB JE | 25 Feb. 2026 (Shift-3)**

1. (d)
It is thermodynamically easier to reduce a metal oxide to its metal form using carbon (coke) or other reducing agents than it is to reduce a metal sulphide directly. This conversion is typically done through a process called roasting.
2. (d)
The Stand-Up India Scheme facilitates bank loans between ₹ 10 lakh and ₹ 1 crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch for setting up a greenfield enterprise.

3. (c) Researchers at IIT Mandi developed a composite using WS and PDMS to protect 2D semiconductors from environmental degradation caused by moisture and oxygen, ensuring their stability for electronic applications.
4. (d) Utkal Diwas (Odisha Day) is celebrated on April 1st every year to commemorate the formation of the state of Odisha as a separate province in 1936.
5. (c) In chemical formulas, brackets are used to enclose a polyatomic ion (like hydroxide, OH^-) when more than one such ion is present in the formula unit. The subscript '2' outside indicates there are two OH groups for every Ca atom.
7. (b) A concave mirror forms an enlarged (magnified), virtual, and erect image when the object (the tooth) is placed very close to the mirror (between the pole and the focus).
8. (b) Vermicomposting is a process in which earthworms (typically Red Wigglers) are used to convert organic waste into high-quality nutrient-rich fertilizer.
9. (a) Check-dams are small structures built across a gully or stream. They slow down water flow, allowing it to seep into the ground (recharging groundwater) and trapping sediment to prevent soil erosion.
10. (c) The Law of Constant Proportions states that a chemical compound always contains its component elements in a fixed ratio by mass. For pure water (H_2O), the mass ratio of Hydrogen to Oxygen is always 1:8.
11. (b) A micelle is formed by soap molecules. The ionic (hydrophilic) head is water-loving and faces outward toward the water, while the hydrocarbon (hydrophobic) tail faces inward toward the center.
12. (b) Kinetic Energy is proportional to the square of the velocity.
13. (b) Baking quality refers to improved quality, and resistance to drought (a non-living environmental factor) refers to abiotic resistance.
14. (c) The Thar Desert (Arid region of Rajasthan) typically receives an annual normal rainfall of approximately 150 mm, characterized by high variability.
15. (b) The Northwestern Plains (Punjab and Haryana plains) are formed by the alluvial deposits of the Indus river system, primarily the Satluj, Beas, and Ravi.
16. (c) Acetone and petrol are volatile liquids. They absorb latent heat of vaporization from our palm to evaporate, causing the temperature of the skin to drop and resulting in a cooling sensation.
17. (c) Sarhul is one of the most important tribal festivals celebrated in the Chhotanagpur region, primarily in Jharkhand, marking the tribal New Year and the blooming of Sal trees.
18. (b) A convex mirror is a diverging mirror. Rays parallel to the principal axis spread out after reflection, but when traced backward, they appear to meet at the principal focus (F) behind the mirror.
19. (b) Article 80 deals with the Composition of the Council of States. Article 99 actually relates to the Oath or affirmation by members of Parliament.