

GIMs - Genesis Ignited Minds Scholarship Test
10th Moving 11th (CBSE)

Time: 2 Hours 30 Minutes.

M.M.: 201

General Instructions for the Paper

- Answers have to be marked on the OMR sheet provided.
- Blank Papers, Cell phones & Calculators are not allowed inside the hall.
- Marking Scheme:-
 - Objective Section (Section A to E)
 - Each Objective question from Section A to E carries +2 marks
 - No Negative marking for wrong answers.
 - Subjective Section (Section A to D)
 - Each subjective question from section A to D carries 5 marks.
 - Section F - Mental Ability
 - Each question in Section F carries 3 marks



Genesis Branches

SCO -294, Sector-20, Panchkula

SCO -13, Sector-15, Panchkula

SCO - 17, VIP Road, Zirakpur (Near Nand Sweets)

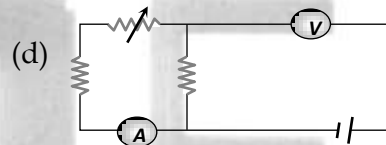
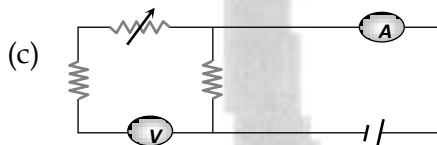
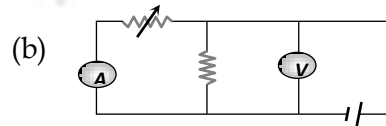
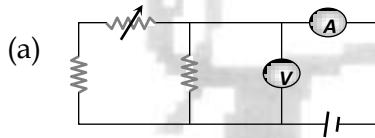
Section A [Physics]

1. A ray of light passes through three different media with refractive indices n_1 , n_2 , and n_3 ($n_1 > n_2 > n_3$) in succession. It enters the first medium at an angle i and finally emerges into air. If the final angle of emergence is e , and the total deviation produced is 0° , what can you say about the relationship between the path that the light ray follows?
- (a) The emergent ray is parallel to the incident ray but displaced sideways
 (b) The emergent ray overlaps the incident ray
 (c) There is no deviation if $n_1 = n_3$
 (d) The refraction angles must all be right angles

2. Three resistors, each of $R \Omega$, are connected in a triangle across a source of emf E . If the current drawn from the source is I , what will be the current through any one resistor?
- (a) $I/3$ (b) I (c) $2I/3$ (d) $I/2$

3. A charged particle moves with velocity v in a uniform magnetic field B . The magnetic force experienced by the particle is
- (a) Always zero (b) Never zero
 (c) Zero, if B and v are perpendicular (d) Zero, if B and v are parallel

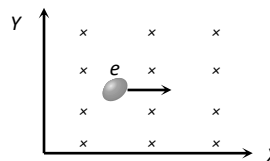
4. Express which of the following setups can be used to verify Ohm's law



5. A piece of wire of resistance 4 ohms is bent through 180° at its mid point and the two halves are twisted together, then the resistance is
- (a) 8 ohms (b) 1 ohm (c) 2 ohms (d) 5 ohms

6. In the given figure, the electron enters into the magnetic field. It deflects in direction (x represent magnetic field goes into the plane)

- (a) + ve X direction
 (b) - ve X direction
 (c) + ve Y direction
 (d) - ve Y direction



7. Match List I with List II and select the correct answer using the codes given below the lists :

List I (Position of the object)	List II (Magnification)
(I) An object is placed at focus before a convex mirror	(A) Magnification is $-\infty$
(II) An object is placed at centre of curvature before a concave mirror	(B) Magnification is 0.5
(III) An object is placed at focus before a concave mirror	(C) Magnification is +1
(IV) An object is placed at centre of curvature before a convex mirror	(D) Magnification is -1
	(E) Magnification is 0.33

Codes :

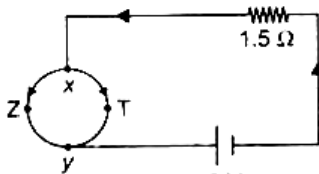
- (a) I-B, II-D, III-A, IV-E
(b) I-A, II-D, III-C, IV-B
(c) I-C, II-B, III-A, IV-E
(d) I-B, II-E, III-D, IV-C
8. A concave mirror of focal length f (in air) is immersed in water ($\mu = 4/3$). The focal length of the mirror in water will be
(a) f (b) $\frac{4}{3}f$ (c) $\frac{3}{4}f$ (d) $\frac{7}{3}f$
9. If the central portion of a convex lens is wrapped in black paper as shown in the figure



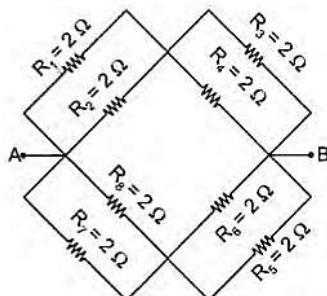
- (a) No image will be formed by the remaining portion of the lens
(b) The full image will be formed but it will be less bright
(c) The central portion of the image will be missing
(d) There will be two images each produced by one of the exposed portions of the lens
10. A convex lens of focal length f produces an image $\frac{1}{n}$ times than that of the size of the object. The distance of the object from the lens is
(a) nf (b) $\frac{f}{n}$ (c) $(n+1)f$ (d) $(n-1)f$

Subjective (5 Marks Questions)

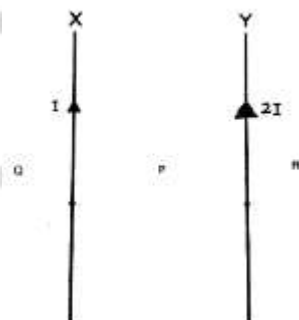
1. (a) Explain how does a cell maintain current in a circuit.
(b) In the circuit given below the resistance of the path $xTy = 2\ \Omega$ and that of $xZy = 6\ \Omega$.
(i) Find the equivalent resistance between x and y .
(ii) Find the current in the main circuit.
(iii) Calculate the current that flows through the path xTy and xZy .



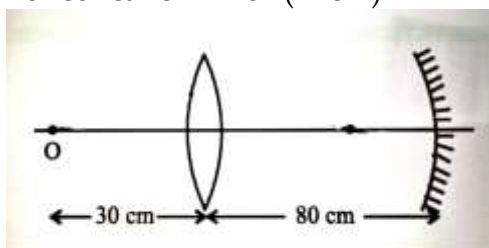
2. (a) A piece of wire is redrawn, without change in volume so that its radius is halved. Compare the new resistance with the original resistance.
 (b) When two resistors of resistance R_1 and R_2 are connected in parallel, the net resistance is $3\ \Omega$. When connected in series, its value is $16\ \Omega$. Calculate the values of R_1 and R_2 .
 (c) Find the equivalent resistance across the two ends A and B of this circuit.



3. If P is the midpoint of 2 conductor x & y then in which direction will be the following charge particle deflect when placed at points P, Q and R.



- (a) a proton moving vertically upwards from point P
 (b) an electron moving towards south from point Q
 (c) a neutron towards west from point R
 (d) an α particle parallel to the direction of current from point P.
4. A convex lens of focal length 20 cm and a concave mirror, having their principal axes align the same lines, are kept 80 cm apart from each other. The concave mirror is to the right of the convex lens. When an object is kept at a distance of 30 cm to the left of the convex lens, the image is formed at the object itself. Find the focal length of concave mirror (in cm)



SECTION - B Chemistry

1. A gardener applies quicklime (CaO) to acidic soil and observes improved plant growth over a month. Which property of quicklime is responsible for this effect?
 - a) It is oxidising the soil
 - b) It neutralizes excess acid in the soil
 - (c) It makes the soil alkaline beyond growth limits
 - (d) It increases water retention

2. Three beakers P, Q, R contain equal amounts of water. A small amount of hydrochloric acid, ammonium chloride, and sodium hydroxide were added to P, Q, and R respectively. Which observation is most likely?
 - (a) Temperature increases in all three beakers
 - (b) Temperature increases in P and R, decreases in Q
 - (c) Temperature decreases in all three beakers
 - (d) Temperature remains same in all beakers

3. In which of the following compounds, $-CHO$ is the functional group?
 - (a) Butanone
 - (b) Butanol
 - (c) Butanoic acid
 - (d) Butanal

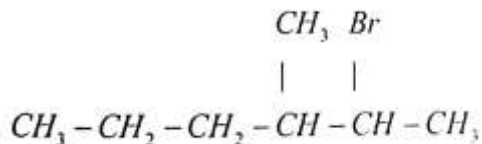
4. Which of the following is a hydrated salt?
 - (a) Lead nitrate
 - (b) Baking soda
 - (c) Washing soda
 - (d) Ferric chloride

5. Three test tubes labeled X, Y, and Z contain aqueous solutions of sodium hydroxide, acidic copper sulfate, and potassium chloride respectively. On mixing equal volumes of these solutions with water, it is observed that the temperature increases in test tubes X and Y, while it decreases in test tube Z. Which of the following statements is/are correct?
 - i. The dissolution in test tubes X and Y is exothermic.
 - ii. The dissolution in test tubes X and Y is endothermic.
 - iii. The dissolution in test tube Z is exothermic.
 - iv. The dissolution in test tube Z is endothermic.
 - (a) (i) only
 - (b) (ii) only
 - (c) (i) and (iv)
 - (d) (ii) and (iii)

6. Three metals – Sodium (Na), Magnesium (Mg), and Copper (Cu) – are separately added to water at room temperature in beakers X, Y, and Z, respectively. The observations are as follows:
In beaker X, vigorous reaction with evolution of gas and temperature increase.
In beaker Y, slow reaction with little gas evolution and slight temperature rise.
In beaker Z, no visible reaction.
Which of the following statements is/are correct?
 - i. Sodium is the most reactive metal among the three.
 - ii. Magnesium reacts faster than sodium with water.
 - iii. Copper does not react with water at room temperature.
 - iv. All metals react with water releasing hydrogen gas.

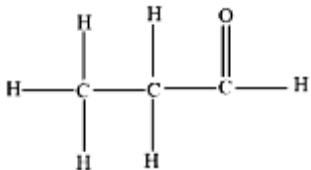
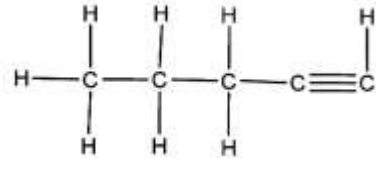
- (a) (i), (ii) and (iii) only (b) (ii) and (iii) only
 (c) (i) and (iii) only (d) All of the above

7. IUPAC name of the following compound is:



- (a) 3-Bromo-2-methylhexane (b) 5-Bromo-4-methylhexane
 (c) 2-Bromo-3-methylhexane (d) 3-Methyl-2-bromohexane
8. Methyl orange is a widely used pH indicator with a sharp color change at acidic to slightly acidic pH values. Consider the following scenario:
 A student performs an experiment by adding methyl orange indicator to an unknown solution. After adding the indicator, the solution turns red.
 Which of the following interpretations is most scientifically accurate?
 (a) The solution has a pH less than about 3.1, indicating strong acidity causing the red color.
 (b) The solution is neutral, and methyl orange shows red color in neutral solutions.
 (c) The solution is basic, and methyl orange turns red due to interaction with hydroxide ions.
 (d) The color change is due to methyl orange decomposing in water.
9. Various hydrocarbons are used as fuels in different applications due to their combustion properties and volatility. Consider the following hydrocarbons with their molecular formulas:
 (i) C_4H_{10} , commonly used in lighters and portable stoves
 (ii) C_3H_6 , used as a starting material for plastics
 (iii) C_2H_4 , used in fruit ripening and plastics
 (iv) C_2H_6 , used as a refrigerant and fuel
 Which of the above compounds are saturated:
 (a) (i) only (b) (iii) only (c) (i) & (iv) only (d) (ii) and (iii) only
10. Identify the precipitate formed during the reaction between lead nitrate and potassium iodide solutions:
 (a) PbI_2 (yellow solid) (b) $\text{Pb}(\text{NO}_3)_2$ (white solid)
 (c) KI (colorless liquid) (d) PbO (black solid)

Subjective Questions (5 marks Questions)

1. (a) Write the balanced chemical equation for the reaction of sodium carbonate with hydrochloric acid. Identify the type of reaction and explain your choice.
(b) Balance the following reaction and also state the type of reaction.
$$\text{Fe}_2(\text{SO}_4)_3 + \text{KOH} \rightarrow \text{K}_2\text{SO}_4 + \text{Fe}(\text{OH})_3 \quad [3+2=5]$$
2. (a) Give IUPAC name of the following compound:
(i)  (ii) 
(iii) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{I}$
(b) Draw the structure of following organic compounds:
(i) Butanone (ii) Pentanol [3+2=5]
3. (a) Give reason for the following:
(i) Hydrogen gas is not evolved when most of the metals react with nitric acid.
(ii) Zinc oxide is considered as an amphoteric oxide.
(iii) Metals conduct electricity.
(b) An element 'X' displaces iron from the aqueous solution of iron sulphate. List your observations if the element 'X' is treated with the aqueous solutions of copper sulphate, zinc sulphate and silver nitrate. Based on the observations arrange X, Zn, Cu and Ag in increasing order of their reactivities. [3+2=5]
4. A metal 'X' reacts with a non-metal 'Y' by transferring electrons to form a compound 'Z'. A student investigates the properties of compound 'Z' and makes the following observations: It has a high melting and boiling point, is solid and brittle at room temperature, does not conduct electricity in solid form but conducts when molten or dissolved in water.
Answer the following:
(a) Explain the type of bond present in compound 'Z'. Additionally, rationalize the high melting and boiling points observed for compound 'Z'. Finally, explain why compound 'Z' does not conduct electricity in the solid state but does conduct when molten or dissolved in water.
(b) if element X has atomic number 11 and Y has atomic number 17, then draw the electron dot structure of the compound Z. [3+2=5]

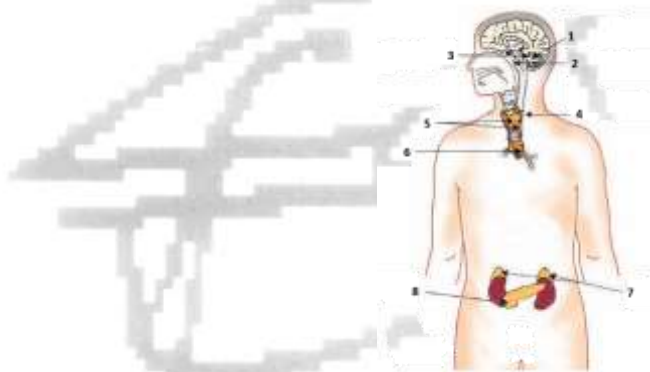
SECTION - C Biology

1. Which part of the brain controls involuntary actions like vomiting or heartbeat?
a. Cerebrum b. Medulla c. Midbrain d. Cerebellum
2. If testes fail to descend into the scrotum, sperm production may stop because:
a) Temperature in abdomen is too high for spermatogenesis
b) Lack of hormones
c) No oxygen supply
d) Less blood circulation
3. Why is the number of chromosomes constant in sexually reproducing species generation after generation?
a. Because meiosis produces haploid gametes
b. Because DNA copying introduces variation
c. Because mitosis produces haploid gametes
d. Because fertilisation does not occur
4. Why do unicellular organisms not need a specialised organ system for exchange of gases?
a. Because they use advanced diffusion systems
b. Because their entire surface is in contact with the environment
c. Because they do not perform respiration
d. Because they store gases internally
5. Blinking of eyes is an example of
a. Voluntary action b. Reflex action
c. Involuntary action d. None of the above
6. Which of the following correctly shows the path of oxygen during respiration in humans?
a. Nostrils → Pharynx → Trachea → Lungs → Alveoli → Blood
b. Nostrils → Larynx → Pharynx → Lungs
c. Trachea → Bronchi → Blood → Alveoli
d. Nose → Bronchi → Diaphragm
7. A person suffering from a blocked bile duct would face difficulty digesting:
a) Proteins b) Fats c) Carbohydrates d) Vitamins
8. In a person's nephron, glucose is detected in urine. This indicates:
a. Damage to collecting duct b. Malfunction of glomerulus filtration
c. Damage in tubule reabsorption d. Excess protein intake

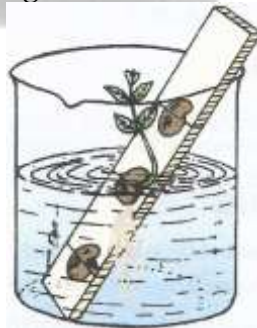
9. The bending of a shoot tip towards light is due to:
 - a. Destruction of auxin on the shaded side
 - b. Equal distribution of auxin
 - c. Accumulation of auxin on the shaded side causing faster growth
 - d. Photochemical destruction of auxin
10. In human respiration, if alveolar surface area decreases due to disease, what immediate physiological effect would occur?
 - a. Less CO₂ diffusion into blood
 - b. Reduced oxygen absorption
 - c. More oxygen absorption
 - d. Increased CO₂ production

Subjective Questions (4x5=20 marks)

1. Observe the given image and answer the following questions: (1+1+2+1)



- a. After consuming a banana split, which hormones would be expected to increase and why?
 - b. Which gland marked in the diagram is responsible for secretion of hormone mentioned in 'a'?
 - c. How is this gland different from the rest of the glands? And what is its other function?
 - d. Which gland marked in the diagram is responsible for activating and inhibiting the functioning of the gland mentioned in 'b'?
2. A. Observe the given image and answer the following questions: (3)

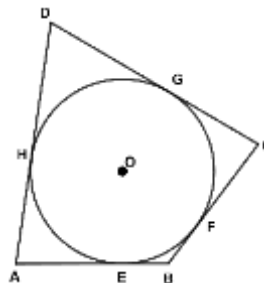
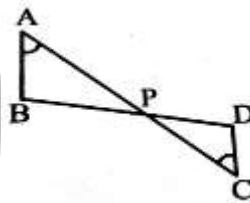


- a. Give a reason why the bottom seed stops germinating after a while.
- b. Why doesn't the top seed present in air germinate?
- c. Name the part of the embryo which emerges out first during germination. Give reason for your answer.

- B. Which out of the two germ cells, is large and contains the food stores and why? (2)
3. A. What is the role of association areas in the brain? (1)
 B. Draw the diagram of the structural and functional unit of the nervous system. Also label the following parts. (4)
 a. where information is acquired
 b. through which information travels as an electrical impulse,
 c. where this impulse must be converted into a chemical signal for onward transmission
4. A. Describe the mechanism of nutrition exhibited by Paramecium. (2)
 B. Give reason (3)
 a. Oxidation-reduction reactions are involved in the breakdown of food.
 b. Leaves are boiled in alcohol during the starch test experiment.
 c. The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms.

SECTION - D Mathematics

1. A die is rolled, the ratio of the probability of getting a composite number to the probability of getting a prime number is
 (a) $\frac{5}{6}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$
2. $\csc^2 \theta + \sec^2 \theta$ is equal to
 (a) $\tan^2 \theta + \cot^2 \theta$ (b) $\cot \theta + \tan \theta$ (c) $(\cot \theta + \tan \theta)^2$
 (d) 1
3. In the adjoining figure, $\angle A = \angle C$, $AB = 6$ cm, $BP = 15$ cm, $AP = 12$ cm and $CP = 4$ cm then $PD + CD$ is
 (a) 5 cm
 (b) 2 cm
 (c) 7 cm
 (d) None of these
4. In the given figure, O is the centre of the circle. ABCD is a quadrilateral where sides AB, BC, CD and DA touch the circle at E, F, G and H respectively. If $AB = 15$ cm, $BC = 18$ cm and $AD = 24$ cm, then the length of CD is
 (a) 27 cm
 (b) 18 cm
 (c) 24 cm
 (d) None of these



5. A paint roller is a paint application tool (as shown) used for painting large flat surfaces rapidly and efficiently. Its length is 26cm long with an outer diameter of 7cm. Then, the maximum area of the surface that gets painted when the roller makes 6 complete rotations vertically, is

- (a) 1092 cm^2 .
 (b) 1000 cm^2 .
 (c) 1292 cm^2 .
 (d) None of these

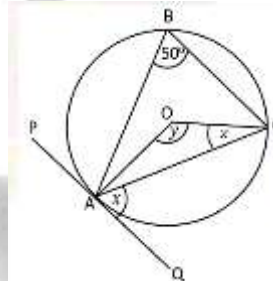


6. The roots of the quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$ are
 (a) non real roots (b) real and equal (c) real and distinct (d) None of these

7. If $P\left(\frac{a}{3}, 4\right)$ is the midpoint of the line segment joining the points $Q(-6, 5)$ and $R(-2, 3)$, then the value of a is
 (a) -4 (b) -6 (c) 12 (d) -12

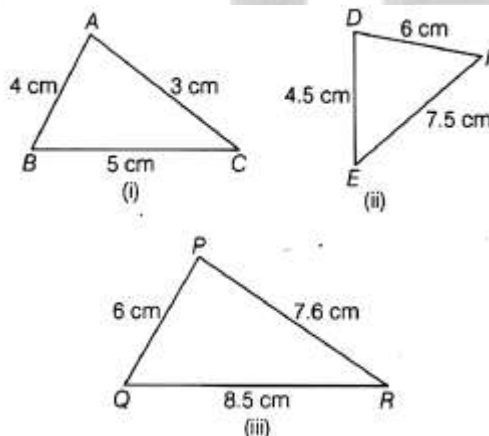
8. In the given diagram, O is the center of the circle, and PQ is a tangent at A . If $\angle ABC = 50^\circ$, then $x + y + z$ equals

- (a) 190°
 (b) 230°
 (c) 210°
 (d) None of these



9. Which pairs of triangles in the given figure are similar?

- (a) (i) and (iii)
 (b) (ii) and (iii)
 (c) (i) and (ii)
 (d) None of these



10. A survey was conducted on 80 gamers to determine how many games they played in a day. The data is given below.
Which of the following is the modal class?

Number of games	Number of gamers
1-2	20
2-3	24
3-4	10
4-5	12
5-6	8
6-7	4
7-8	2

(a) 1-2

(b) 2-3

(c) 4-5

(d) 7-8

SUBJECTIVE (No Negative Marking)

- The teacher asked the students to correctly complete the following sentence about the rhombus. "A rhombus has a side length of l units and one of its angles is equal to $\emptyset$. The ratio of the lengths of the two diagonals is dependent on?
Amayra: only l .
Brinda: only $\emptyset$.
Cristie: both l and $\emptyset$.
Yukti: neither l nor $\emptyset$.
Who answered the question correctly? Show your work and give valid reasons.
- Starting with a positive integer M written on the board, Sameer plays the following game: in each move, if x is the number on the board, he replaces it with $3x + 2$. Similarly, starting with a positive integer N written on the board, Harsh plays the following game: in each move, if x is the number on the board, he replaces it with $2x + 27$. Given that Sameer and Harsh reach the same number after playing 4 moves each, find the smallest value of $M + N$.
- The curved surface area of a right circular cone is half of another right circular cone. If the ratio of their slant heights is 2:1 and that of their volumes is 3:1, find ratio of their:
(a) radii (b) heights

4. The circle ω touches the circle μ internally at P. The centre O of μ is outside ω . Let XY be a diameter of μ which is also tangent to ω . Assume $PY > PX$. Let PY intersect ω at Z. If $YZ = 2PZ$, find the magnitude of angle PYX in degrees?

SECTION - E English

1. The irony of the story's ending lies in –
 - a) Matilda's pride leads to her ruin over a fake jewel
 - b) She finally achieves wealth
 - c) Her husband blames her
 - d) The diamond was stolen

2. Bholi's rejection of Bishamber symbolizes –
 - a) Women's empowerment and dignity
 - b) Rebellion against parents
 - c) Hatred toward men
 - d) Fear of marriage

3. The turning point in Bholi's life is when –
 - a) She goes to school and gains confidence
 - b) Her marriage is arranged
 - c) Her teacher scolds her
 - d) Her parents praise her

4. In 'For Anne Gregory' poem uses the "yellow hair" as a symbol of –
 - a) Anne's vanity
 - b) Physical beauty that fades
 - c) Jealousy
 - d) Innocence

5. The tone of The Trees can best be described as –
 - a) Hopeful and liberating
 - b) Melancholic
 - c) Critical of urbanization
 - d) Angry and political

6. The poet compares fog to a cat because –
 - a) It moves silently and mysteriously
 - b) It is playful
 - c) It pounces aggressively
 - d) It represents danger

7. Matilda's tragedy is primarily due to –
 - a) Her vanity and materialism
 - b) Social injustice
 - c) Bad luck alone
 - d) Her husband's negligence

8. If _____, I would not lose temper.
 - a) I am you
 - b) I was you
 - c) I am not you
 - d) I were you

9. Fill in the blank:
 "No sooner had I completed the test ____ the bell rang."
 - a) when
 - b) then
 - c) than
 - d) after

10. I prefer coffee _____ tea.
 - a) over
 - b) before
 - c) to
 - d) instead

Section F [Mental Ability]

1. The Colored Switches (Logical Deduction)
You have three identical, unlabeled boxes. One contains two Red marbles (RR), one contains two Blue marbles (BB), and one contains one of each (RB). All three boxes are labeled, but every single label is guaranteed to be incorrect. If you are only allowed to take out one marble from one box, how can you correctly label all three boxes? EXPLAIN
2. The Mysterious Mirror Clock
A watch shows 4:15. In a mirror, what time will it appear as?
3. The Light Race
You switch on a torch inside a moving train. To someone outside watching through the window, does the light move faster, slower, or the same?
4. The Number That Wanted to Vanish
You can write me in words, but if you remove one letter, I become even. What number am I?
5. The Family Photo Trick
In a photo, Ravi says, "I have as many sisters as brothers." His sister Rina says, "I have twice as many brothers as sisters." How many brothers and sisters are there?
6. The Numeric Code
You have a code where each letter corresponds to its position in the alphabet (A=1, B=2,... Z=26). The message "20 8 9 19 9 19 5 1 19 25" is given. Decode it.
7. The Letter Sequence (Number Pattern)
What is the next letter in the following logical sequence?
O, T, T, F, F, S, S, E, ?

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Physics

1.A	2.D	3.D	4.A	5.B	6.D	7.A	8.A	9.B	10.C
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Chemistry

1.B	2.B	3.D	4.C	5.C	6.C	7.C	8.A	9.C	10.A
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Biology

1.B	2.A	3.A	4.B	5.B	6.A	7.B	8.C	9.C	10.B
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Maths

1.D	2.C	3.C	4.A	5.A	6.B	7.D	8.A	9.C	10.B
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English

1.A	2.A	3.A	4.B	5.A	6.A	7.A	8.D	9.C	10.C
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